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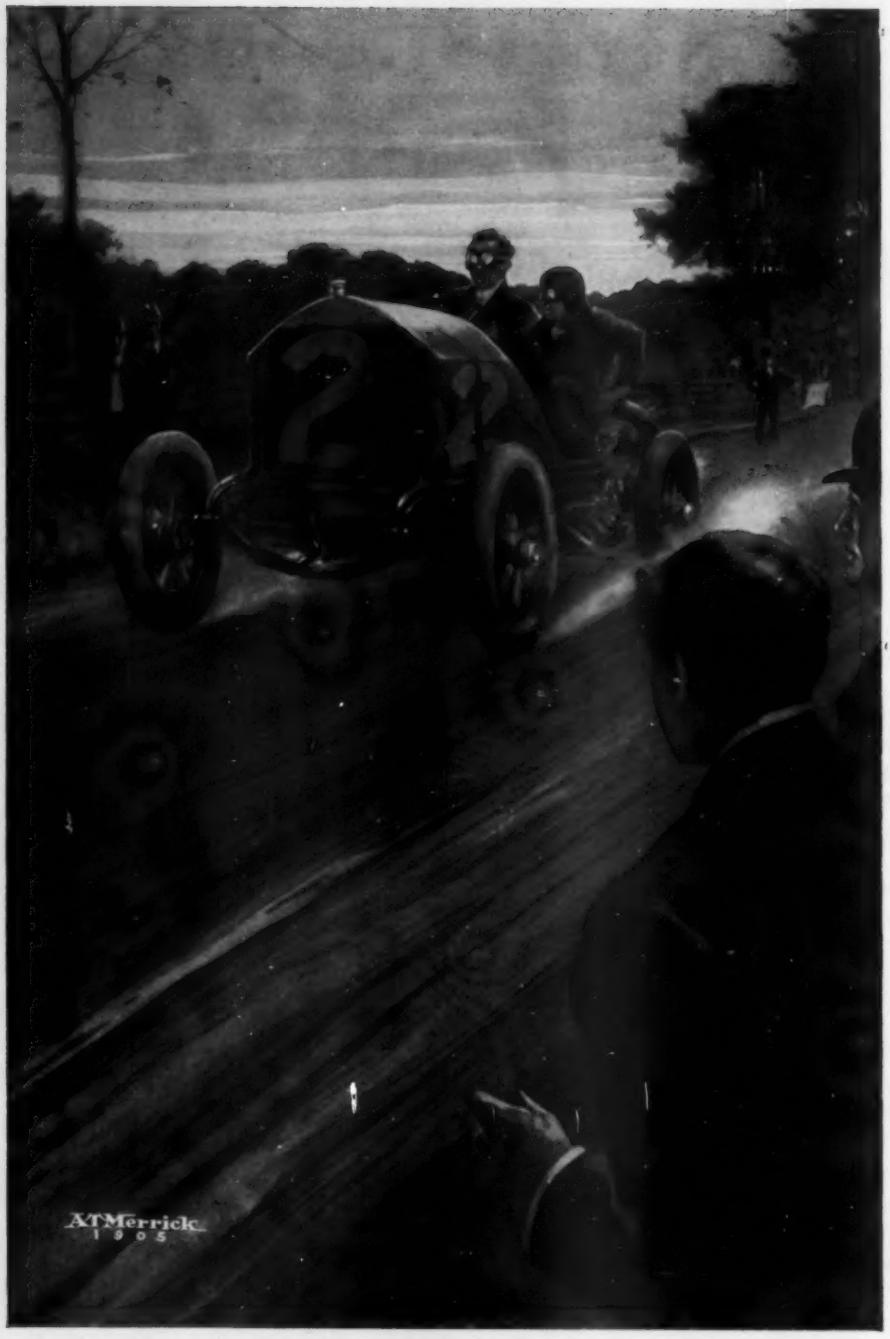

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THE
AUTOMOBILE MAGAZINE

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Seeing Paris and Being Seen There

By Helena Smith Dayton

IF you would enjoy watching Paris hold its sides in uproarious laughter, mount, then, the sight-seeing vehicle known as the "rubber wagon." Paris, that takes nothing seriously, finds in the big automobile that solemnly rolls through the streets with a cargo of curiosity perched atop, quite the funniest thing in the whole world! There is only one thing funnier and that is witnessing the uncontrolled mirth that everywhere greets the giant car. Small boys—or that quaint old person that in France passes for a juvenile—relax and dance with derisive yells around the sight-seers, older people point and collapse into a spasm of laughter; everyone is overcome, as it were, by the sight.

At first, these attentions seem to you poetic justice for the condescending smiles you have cast after the New York automobiles of this character. You never thought that you would be caught on one of them, and not only with amused smiles cast your way, but the howls of a ridiculing populace! You feel like Eva Gonowosky who "didn't need a ride on the rubber-neck boat-birds what howlers in Central Park." To descend and steal quietly away! But this is impossible—for the little ladders were left at the starting point, and you are up for keeps, until the journey's end.

Down the street comes a brilliant company of French soldiers—already their saucy eyes are upon the "rubber wagon," and they are joking among themselves, preparatory to the avalanche of ridicule they will presently heap upon the pleasure party. But as they toss airy French slang—which you never learned in your French class, and for which you may search in vain in your "Complete Guide to Paris"—one enters into the spirit of the occasion and delights in every French insult hurled from the sidewalk.

The conversation of your fellow passengers is diverting—for instance:

"Yes, this is the first time I have ever been in an automobile. I don't see as it is a reckless sport. Perhaps this driver is unusually careful, though. It's certainly a fine way to see the city. Aren't they used to automobiles here in Paris? They make such a fuss over this one, you'd think they'd never seen anything in their lives, poor things. The French are queer, but I like their cooking.

Speaking of cooking, I have tried to get some Hubbard squash in England and over here, but do you know, I haven't seen a bit since I left home. And I am so fond of Hubbard squash!"

You don't dare look around, but you label the speaker "New England" and let it go at that. A person who will sigh for Hubbard squash in France will want a harmonica instead of a golden harp when she gets to heaven.

But it is very interesting to observe the types that are represented on that "rubber wagon." A well known millionaire and his wife, the latter noted for her exclusiveness, seem to be enjoying themselves hugely; dozens of people who couldn't be tempted to board a vehicle of this kind in their own country are highly pleased with their trip. There is a good fellowship established among the strangers collected on the graduated seats up in the air—possibly because ridicule likes company and one keeps propping up one's snobbish pride by thinking "What nice cultivated people go on these trips! I'm glad I came."

Suddenly a fear clutches at your heart. What is this terrible noise and confusion? Is it the outbreak of another revolution—another reign of terror?

Merely another little knot of citizens who have caught sight of the big automobile—and the big automobile—it is to laugh!

Replacing a Tube Properly

Whenever the unpleasant necessity of replacing a burst or punctured air tube on the road is forced upon you, before putting in the new tube examine the nut which holds the valve to the air tube. Very often this nut shakes loose through continual vibration of the car; furthermore, there is almost sure to be a slight contraction of the rubber between the nut and the valve seat, so that when called upon to perform its duty there is a mysterious leakage which cannot be traced to a puncture. Before putting the tube in try this nut with a wrench, and screw it down as tight as possible. A thin bicycle wrench will be found most suitable for the purpose, since the turned-up edges of the valve plate necessitates the use of a wrench with very thin sides.

Magnified Maps for Night Use

During the recent German army maneuvers, maps readable at night were used. The new map is photographed on a small glass plate, pocket size, and is not affected by rain. It is provided with a small electric lamp and a magnifying glass. Something of this kind would, it seems to me, find a very hearty welcome among the great army of motor tourists, members of which are to be found upon almost every road in Europe and America.

Scotch Automobiling and Golfing

By Angus Sinclair

TROON ON THE FIRTH OF CLYDE

ON arriving in London, my first attention was devoted to comparing the number of automobiles on the streets of the English metropolis with the numbers to be seen in New York. This seems to be a very natural thing for an American to do, for among the fellow countrymen I met the talk about the comparatively small number of motor carriages to be seen on the London streets was an ever-recurring theme of conversation.

Americans of the class who own automobiles are inclined, when at home, to make odious comparisons about American motor cars and to praise what is seen abroad, but I notice when the same people are encountered at a distance from home they generally wax very patriotic and stand up for the productions of their own country.

On the day of my arrival at the Great Northern Hotel, which is on one of London's long arteries of traffic, I sat at my window for an hour or two watching the passing show, and I was soon struck with the small number of automobiles that passed. Next day I rode for several hours in a hansom cab through what is known as the most fashionable quarters of the great city, and again I found that the sight of a motor car was comparatively rare for one direct from the sights on New York streets. About a week spent in the city led me to the conclusion that London has about one automobile for ten to be seen in New York.

There is one different condition in respect to self-propelled vehicles in the British Isles from what there is in the United States. The light runabout automobile is notable for its rarity. Nearly all automobiles seen are heavy vehicles of the touring types, the possession of such a vehicle being evidence of wealthy owners. The hateful motor bicycle is much more in evidence than it is with us, and there are numerous nondescript vehicles such as one with a side-seat attachment to a motor cycle, but the comfortable runabout makes slow progress into favor. In America doctors find light runabout automobiles useful business vehicles which they operate themselves. In Great Britain no doctor uses an automobile unless

Photograph by John Jeffrey, Selkirk

WATCHING PLAYERS IN SCOTS-ENGLISH MATCH

he can afford to hire a chauffeur to run and care for it. Yet thousands of men wrestle with motor cycles that are quite as hard to manage as a four-wheel runabout.

Mechanical and engineering pursuits were developed in Great Britain before they made much progress in other countries; therefore, it might naturally be inferred that the ordinary Briton would take readily to the handling of mechanical appliances, but he does not. He looks for men specially trained to handling machinery. The jack of all trades is less in evidence there than with us. You often hear the Latin saying: "*Ne sutor ultra crepidam*" repeated, that is to say: Let the shoemaker stick to his last, and they adhere in practice to the policy. The agricultural machinery imported from America to the British Isles has often been a source of trouble to the owners, because farm laborers have no capacity for overcoming the slightest difficulties that are always liable to happen. They habitually depend upon the village blacksmith to exercise the supervision over the machines that American farm hands attend to themselves.

There would be a splendid field for light runabout automobiles in Great Britain if the natives would study the mechanism sufficiently to manage the machines. A schoolboy being asked what is a gentleman replied, "A man who keeps a gig." There are so many people in these parts who keep a horse and gig that they will make great business for automobile manufacturers if they ever take to runabouts, which are now as reliable as a horse and much more convenient.

From London I went northwards by stages, stopping at Manchester, Glasgow, and other places, always watching closely the most interesting features of railway operating and the progress of automobiling. An automobilist, who has been jolted at his modest speed over American highways, can hardly keep from coveting the splendid roads that one encounters from London to Scotland's far-north John O'Groats.

I noted a curious thing about automobiling in my travels. In England where small towns are often so numerous that one is never a rifle shot from a dwelling, the sight of a motor car was rare, but when I got away beyond Perth into the Grampian Hills, when miles would be passed without sight of a human habitation, automobiles were much more in evi-

Photograph by John Jeffrey, Selkirk

A HAZARDOUS SPOT TO DRIVE OVER

dence than horses. In the thickly inhabited districts, automobilists are held down to legal speed as closely as the minions of the law can enforce their authority. But on the magnificent roads through solitary heath embroidered glens, devoid of life save sheep, red deer and grouse, there is no enforced limit to speed, and there the motorist is in his glory.

One of my trips was to Mr. Carnegie's home at Skibo Castle, away towards the jumping-off place of Scotland's northern limit. Part of the journey was over the Highland Railway. It was on an express train making few stops. When the train was winding along the rock-bound defiles of the Garry river near Killiecrankie, where Bonnie Dundee fought his last battle, I caught sight of an automobile speeding along the highway that went through the passes followed by the railway. It was lost from view for a few miles, but on emerging from a stretch of rugged scenery, the road came in view, and there was the big touring automobile tearing along with a cloud of dust in its wake. On it came, and presently was alongside. It contained five persons, but the load was well within the capacity of the power. It seemed that all the passengers in the train were hanging out of the windows waving handkerchiefs at the automobile and the salutes were heartily returned. It is to be supposed that the engineers of the train—there were two engines—dropped their expansion links a notch or two, for the automobile chauffeur was using a full throttle. After an exciting race of several miles, where neither side had much to boast of, a hill took the motor car out of our sight and soon the train had to stop for a meeting point. When we saw the automobile again it was miles ahead. Then it stopped in one of the few clachans on the wayside and we passed them. Later in the day when Inverness was not far away our brave automobile came snorting up and passed the train. The last we saw of them, a brazen-faced young woman was holding out a long ribbon streaming behind with the implied invitation, Have a tow, do!

They were getting into a district of residences where it is dangerous to indulge in high speed and with the perversity of motorists, those had selected that part to leave an express train behind.

On reaching the station at Inverness, the beautiful capital of the Highlands, I found the cab square filled with automobiles of the tourist variety. The sight surprised me at first,

but I soon learned that numerous gentlemen who were hunting in the Highlands had taken to the automobile as a means of transportation to the remote glens where shooting lodges are the principal human habitations, and that the motor cars are used as a medium of communication between the sportsmen and the outside world. That accounted for the great number of automobiles we had seen speeding over the lonely Highland highways.

At the sportive time of the year these solitudes of mountain, moor and blooming purple heather are full of transient inhabitants, many of them staid merchants and manufacturers, taking a month's holiday for the shooting. An old "gillie" described them as going out in the morning full of hope and coming back at night full of whisky with no fear of God in them.

The ordinary Scots laird, the rural magnate, moves slowly away from the practices of his forefathers. He hates changes and has only patronized agricultural machinery through grim necessity and he feels free to abhor all innovations of the horseless carriage kind. Among such people in the North of Scotland, Mr. Carnegie is an apostle of safety in change and leads the way on the inevitable course that will eventually make fuel perform the exacting toil that poor horses now do under semi-torture.

Part of the fine stables connected with Skibo Castle has been converted into a garage, and seven or eight automobiles do the principal work of transporting visitors and supplies to and from the railway station, ten miles away. When Mr. Carnegie first thought of making use of motor carriages, he was embarrassed concerning the disposal of his coachmen and other faithful servants of that class. When he talked to me on the subject, I expressed the opinion that the coachmen could be converted into acceptable chauffeurs if an expert on automobiles had supervision. On visiting the garage I was much gratified to find that the by-gone head coachman had acquired sufficient knowledge of automobiles to take charge of all the vehicles. Being a very intelligent man he quickly learned enough to supervise the running of the motor vehicles. There are several heavy brakes driven by electric batteries, a species of power wholly unsuited to the hilly roads of the district. There are also several electrically driven carriages, but two fine gasolene touring cars have been purchased, and it was easy to see that they are so much in favor that they will soon crowd out the electric vehicles.

Scotsmen as a rule are very closely wedded to their own occupation, and I was surprised to find that several of the horse-driving coachmen look forward to spending the winter in places where they will learn to care for, run and repair automobiles.

To me a sojourn at the ancient baronial castle of Skibo has always been like taking part in the scenes of one of Scott's romances. Meeting in social converse with many of the most distinguished people of to-day is like unto the old-time assemblies of Scott's lords and ladies gay.

"With more than mortal powers endow'd
How high they soar above the crowd!"

The laird and lady of Skibo display the most attractive characteristics for which the heads of Highland houses were formerly noted. They practice true hospitality that means to honor the aristocracy of intellect and

worth wherever its members reside, and brings to the castle the select of two continents. The warm-hearted welcome is quite as alluring as it ever was in the gala days of clanship, only the boisterous song, the vigorous dance and the tumultuous clatter of arms have been changed to the refinements of exercise and amusement that befits the advancement accompanying peace and highly developed refinement.

Mr. Carnegie is an ideal host, always in the lead in the entertainment of his friends, never failing to display the powers that have made him great when the occasion arises, and that often arrives through the varied topics of conversation that arise among the guests of varied acquirements. I have known Mr. Carnegie for many years and rejoiced in the good fortune that came to his lot. In it all, I think the best favor of fortune that ever came to him was in Miss Louise Whitfield becoming his wife.

SKIBO CASTLE

At Skibo there is none of the boisterous doings seen at some of the mansions where wealth and fashion assemble. Here all is rational enjoyment of the kind suited to the tastes of the various guests.

At seven in the morning the silence of the night is broken by the stirring notes of the bagpipes playing "Hey, Jonney Cope, are ye waukin yet?" and other sleep banishing tunes. Half an hour later the great organ strikes into melody intimating that the breakfast hour is approaching. At 8 a goodly company has assembled in the dining room, the people help themselves to what they want, and breakfast proceeds in a sort of conversazione, the projected doings for the day forming the principal theme of talk. Afterwards the laird or the lady ask the guests individually their preference for amusement. There is driving, and fishing, and golf for the ladies to choose and the gentlemen who desire it have shooting out in the hills, or they may join the ladies in the milder amusements. All soon scatter their several ways, all to meet again at dinner, the interesting social meal of the day where everybody becomes ac-

quainted and where all try to contribute to the entertainment of the company.

My choice of amusement was golf playing on the fine links about two miles from the castle. The course is laid out on the sand dunes of the Dornoch Firth and are delightfully situated, fanned by the bracing saline air, with the woods of Skibo on one side and the bold, solitary hills of Rosshire across the estuary.

Golf contests with football the honor of being the national game of Scotland. The devotees of both games were prosecuted many times over three hundred years ago for preferring amusement to attendance on mass; but that did not cure the people of their passion for the two forms of vigorous amusement. Fondness for the game of golf in Scotland seems to reach from the cradle to the grave. You see tots hardly able to walk, with small clubs in their hands, toddling after golf balls, and you find hoary patriarchs tottering about whose palsied arms seem to find a return of ancient vigor as they swing the life-inspiring golf club.

Scotsmen take their amusement very seriously as they take their work and their whisky, but their devotion to amusement after the work of the day is done makes a long-lived nation.

Most of my holidays were spent at Troon, a most attractive watering place on the Firth of Clyde, about 33 miles from Glasgow. There are four 18-hole golf links at the place, and the most enthusiastic set of golf playing people reside there I have ever met. One of the golf courses belongs to the town, the council having opened it this year to attract visitors to the place. It was an excellent investment, for the enterprise has proved a great success, and brought so many changes to the place that the whole expense incurred will be redeemed in two or three years.

Troon is a great coal shipping port. One year, a party of German coal merchants who had dealings with Troon handlers of the black diamond, came on a business visit. It happened to be the time when a golf match was on between the coal merchants of Troon and those of a neighboring city. When the Germans arrived and made inquiries after some one they

Photograph by John Jeffrey, Selkirk

THE GALLERY WATCHING PUTTING IN SCOTS-ENGLISH MATCH

Photograph by John Jeffrey, Selkirk

STARTING FROM TROON GOLF CLUB HOUSE

had done business with, they were generally told that he was out golfing. Next year the Troon coal men visited their German correspondents, and they were introduced to others as the men who made a business of golf playing and sold coal for fun.

The links of Troon are wonderfully inspiring to players. The municipal course is nearly four miles around and the Troon Club links little shorter and much more hazardous, for it is located amidst high sand bluffs that are hard to climb, to say nothing of playing over. This club has 700 members. Its appearance may be judged from the pictures shown.

Under the tuition of my friend Mr. Dan McCormick, I played round eighteen holes in one of the links, forenoon and afternoon, for about three weeks, making quite a strenuous time of rest and recreation.

The springy turf seemed to allure the player to another round, and the dotting of blue bells, craw flowers and purple heather invited more steps from the willing feet. The scenes around were stimulating to activity. It is the Land of Burns with many a celebrated spot within view. Beside us was the spreading estuary of the Clyde with the mountains of Arran and Argyle on the background and towering Ben Lomond on the horizon. To the south are seen the spires and chimneys of Ayr.

"Auld Ayr whom ne'er a town surpasses
For honest men and bonnie lasses."

A rising upland to the west of Ayr is part of the region

"Where Bruce ance ruled the martial ranks
And shook the Carrick spear."

Here Doon rises wimpling clear, and the spot where its waters fall into the briny ocean can be seen from some points of the links. To the left those shadowy tinted hills are where

"The rising moon began to glower,
The distant Cumnock hills out ower."

And round the view range we have Tarbolton, and Mauchline, and Kilmarnock, with other spots that the Ploughman

Bard has made famous and will be regarded with interest as long as poetry inspires the human heart. Further round the circle we can see the spires of Kilwinning, where Masonry was first established in Scotland in connection with the building of an abbey in the twelfth century.

No wonder that with such environments the Troon links are the favorite playground of teeming Glasgow. But Troon does not monopolize the crowd seeking pure air and health inspiring amusements. For twenty miles along the Clyde estuary, extending to Ayr, the traveler seems to be constantly passing through golf links with their formidable bunkers and alluring flags.

The Glasgow & Southwestern Railway has a monopoly of bringing people to this district, and they extend excursion privileges that bring great crowds in the "week end," which means Saturday and Sunday. Sunday golf playing is not tolerated in this Land of Burns, but the nobility about Edinburgh, who have no restraint upon their play day leisure, have defied Scottish prejudices, and golf playing on Sunday is becoming common on the links in the neighborhood of the country's capital.

The Ladies' Club of Troon has about 400 members who are just as zealous sports as the gentlemen. During the summer there were a great many matches played among the ladies, and the attractions of play were at a fever heat. At this time a noted preacher began holding forth daily in one of the churches making a sort of counter-irritant to the golf playing itch. One noted golfer determined to take in the preaching, for few Scotswomen can deny themselves the pleasure of churchgoing. As she was about to enter the church door, a boy ran up and called out "Caddie, ma'am?" and it was only then she noticed that she was carrying her bag of golf clubs to church.

What Too Much Advancing Does

Advancing the ignition too much sets up strains upon the crankshaft and engine generally, because the premature ignition causes the charge to be fired before the upstroke is completed. The result of this condition of affairs is that there results, as it were, a fight between the momentum of the flywheel and the premature explosion. That is to say, the explosion tries to drive the piston down before it has completed its upstroke. The best way to understand this is to imagine that the ignition is so very much advanced that the charge is fired before the upstroke is half completed. This is an extreme case which would not occur in practice, but it is simply given as a sort of reductio ad absurdum.

Some Interesting Muffler Discoveries

By William G. Carrington

BY designers, builders and users the forced employment of mufflers in connection with the use of explosive motors on automobiles has always been regarded as a disagreeable necessity, on account of their absorbing power through the resistance offered by the muffler to the passage of the burnt gases. At the trials held in Paris two years ago, it was found that the best muffler absorbed no less than 11 per cent. of engine power and gave nothing back therefor except a decrease of noise. This was a high price to pay for silencing the motor, since it obviously meant that an engine destined to perform certain work had to be at least 10 per cent. larger and heavier than if it were not fitted with a muffler. Makers of various kinds of mufflers have, therefore, been endeavoring to lessen the resistance in these appliances, and with such a good effect that the majority of those presented at the recent trials in Paris only reduced the engine power by 5 per cent. While this showed that the designing of mufflers has been making satisfactory progress, the trials themselves revealed new facts tending to prove that silencers may actually be made to increase the engine power.

When tested on a single-cylinder motor, the power absorbed was never less than 5 per cent.; but when fitted to a four-cylinder engine the muffler produced loss was often reduced to 2 per cent. and less, even though the volume of burnt gases passing into the muffler was more than double that discharged by the single-cylinder motor. Seeing that each of the cylinders of the bigger engine is of smaller capacity than the single-cylinder motor, it obviously follows that the lower resistance in the silencer must be due to the smaller velocity of the burnt gases, the volume having little or nothing to do with the matter. The problem of proper muffling is, therefore, reduced to lessening the velocity of the gases instead of expanding them gradually by more or less ingenious devices, as was the former practice.

Pursuing this idea further, French engineers formulated the theory that if the efficiency of a silencer can be increased by simply reducing the velocity of the gases, it is quite probable that a resistance is offered by the atmosphere when the exhaust is discharged free. The noise of the exhaust shows that there must be a shock of the gases against the atmosphere, hence resistance and loss of power, thereupon the investigators decided to carry out experiments in this direction. Before this could be done the engineers got striking confirmation of this fact when testing one of the silencers which had to be connected with the engine by a long pipe instead of being bolted direct to the exhaust pipe, as was the

case with the other apparatus. The loss of power with this muffling amounted to five per cent. In order to ascertain how much the pipe itself was responsible for this loss the apparatus was disconnected. The pipe, nearly 6 feet in length, had a diameter slightly less than that of the exhaust pipe, and was bent in a coil. The exhaust pipe terminated in two branches, which were bent alternately so as to allow of the exhaust passing first into the long bent pipe, and then discharged freely into the air. This experiment was carried out repeatedly, and on each occasion it showed a difference in the power developed by the engine.

Measured by a dynamo, and a speed indicator giving the output and the number of revolutions at which the motor was running, it was found that the engine developed 1.4 per cent. more power when the burnt gases were passed through the pipe than when they were discharged direct into the atmosphere. As the burnt gases pass freely through the pipe, there can obviously be no resistance except that offered by the walls of the tube, nor is there anything to check their velocity beyond the changes in their direction around the bends formed by the coil. The principal factor in reducing the velocity must, therefore, it is assumed, be the rapid removal of calories from the exhaust in contact with the considerable surface offered by the pipe, when their temperature falls to such an extent that they leave the tube almost at atmospheric pressure.

That there is something in this theory will be understood when you watch the exhaust of an industrial engine from a long vertical pipe projecting above the roof of a building. It will be noticed that in such a case the exhaust is appreciably muffled. It can, therefore, easily be imagined that a thin copper tube of sufficient length would act as a radiator, and allow of the burnt gases leaving at atmospheric pressure, so that the engine will develop more power than when the exhaust is discharged free and meets with resistance from the air.

Another explanation suggests itself, in view of the good results that have been obtained by the use of long exhaust pipes in gas engine practice. It is that the momentum of the gases through the pipe tends to produce a vacuum in the cylinder, and thus reduces the back pressure. The facts found by the French engineers are interesting, and may possibly result in the designing of types of mufflers on the radiator principle, which will overcome the objections which are now made that such apparatus is guilty of taking power from the engine.

The Documents in the Case

By Chug Chug

I DO not think that with you, my dear reader, as the jury, I need enter into any plea for or against either of the parties in the case of Peach vs. Pinch. The documents which follow will, I am certain, cause you to render the verdict of "served him right" and so I lay them before you in the order of their production without comment of any kind:

Letter from Percival Pinch to Paul Peach:

17 Jerusalem Road, Sept. 10, '05.

My Dear Paul,—Snooper, who you will remember was the smartest fellow in our class at college, tells me that you are on the lookout for a small second-hand car. It has struck me that my little two-seated Jouncer would be just the thing for you. Although I have had it now about six months, I have used it very little and have really only done about 150 miles on it, and consequently it is as good as, or even better than, new. As you doubtless know, the maker's price for this car is $900, and, in addition to that, I have spent about $100 in various little improvements of my own. I intend getting a bigger car and if you want this little beauty for only $750, she's yours for the asking.

Yours very sincerely,

PERCIVAL PINCH.

Letter of same date from Percival Pinch to Metropolis Store & Motor Mart:

Gentlemen,—As I have not received any answer to my last letter I must ask you what you intend doing in the matter of the car I purchased from you six weeks ago. During that time I have managed to travel a total of fifty miles, and my bill for repairs has been over $100. If you do not live up to the guarantee you gave me when I bought the car to take it back and return me the $500 I paid for it if the car was not in every way satisfactory, I shall see District Attorney Jerum about what I consider a perfectly plain case of ordinary, every-day stealing.

Awaiting your prompt reply, I am,

Very truly yours,

PERCIVAL PINCH.

Letter from Paul Peach to Percival Pinch:

Harvard Club, Sept. 12, '05.

Dear Pinch,—Thanks for your letter of the 10th. I am looking out for a small car about the size of yours, and it is indeed very kind of you to offer me yours at such a concession in price. If it is agreeable to you I will call round to-morrow and have a look at it. Yours truly, PAUL PEACH.

Note from Percival Pinch to Paul Peach:

New York Rota Club, Sept. 13, '05.

My Dear Peach,—I am awfully sorry but I have entered my car in the club's runabout championship so both it and myself will be out of the city until Saturday. After that we are both at your command. Hastily,

PINCH.

Note from Percival Pinch, sent at the same time to Mendum & Hycharge:

New York Rota Club, Sept. 13, '05.

Send to Swindlemore's garage for my Jouncer runabout and have it in running order by Saturday without fail.

Very truly,

PERCIVAL PINCH.

Letter from Percival Pinch to Paul Peach:

New York Rota Club, Sept. 15, '05.

My Dear Paul,—I was sorry to disappoint you on the 13th, but you know

how it is in these club races. You've really got to enter them so as to make them a success. I've got the car back to town now, however, and while the race was rather a hard one and shook her up a bit, even if she did not win, if you will meet me here at the club say at 4 o'clock on Saturday, we will go round to Swindlemore's and look the little beauty over.

Very sincerely,

PERCIVAL PINCH.

Letter from Paul Peach to Percival Pinch:

Harvard Club, Sept. 17, '05.

Dear Pinch,—After seeing the car and hearing your account of how well it has served you, I have decided to take it. Please find enclosed my check for $750 as per your very kind offer of the 10th inst. I will send a chauffeur I have just hired from the Correspondence College of Chauffeurism for the car tomorrow. Again thanking you for your kindness to me in this matter, and assuring you of my willingness to return it in kind should at any time in the future I be given an opportunity to do so, I am, Very gratefully your friend,

PAUL PEACH.

Letter from Percival Pinch to Mrs. Leffingwell Butes:

New Rochelle, Oct. 7, 05.

Dear Mrs. Butes,—Very many thanks for your kind invitation to your house party at Tassell Terrace on Tuesday, where you say I shall meet my old college chum, Mr. Peach. I am afraid, however, that a prior engagement will not permit of my accepting the invitation, much as I am sure, you know, I should like to. With very many thanks,

Yours truly,

PERCIVAL PINCH.

Letter from Paul Peach to Mrs. Leffingwell Butes:

Harvard Club, Oct. 7, '05.

Dear Mrs. Butes,—It is awfully good of you to ask me to go to Tassell Terrace on Tuesday. I am afraid, however, I cannot avail myself of your kindness, as I am laid up with various damages resulting from my automobile collapsing while going down Geehawking Hill on Saturday. I hope to be out of the doctor's hands in about three weeks. I should very much liked to have been able to accept your invitation, as you say my old classmate, Mr. Pinch, is to be one of the party, and it would afford me great pleasure to meet him once again.

Very sincerely yours,

PAUL PEACH.

Foot Education is Essential

Far more than might be supposed depends upon the manner in which the left foot is schooled to let the clutch in gently. Some drivers seem to imagine that it does not matter how suddenly they let their clutch in, so long as the engine is racing fast enough to avoid its being stopped; whereas every good driver knows that each jerky application of the clutch adds its quota to the wear and tear of the engine, the transmission gear, and the tires, while many such little quotas added together amount to an appreciable quantity of wear and tear, in precisely the same manner as the constant drip of water wears away the hardest stone.

Late Autumn and Early Winter Road Riding

By an All-Year Road User

ALREADY, as I write, late fall and winter plans are under discussion by thousands of American automobile owners. Some of them have a few more runs to make, probably during our unexcelled "Indian summer," and then they will turn to other things for four or five months. Others, more fortunately situated than the majority of us, can transfer themselves, bag, baggage and automobile paraphernalia, to the South or the Pacific Coast, for a stay limited only by inclination. Meanwhile their business at home runs itself, or is managed from afar "by proxy"; or, perhaps, in a larger number of cases, their investments keep up their accustomed dividends, and close, personal attention to them is unnecessary.

These more fortunate devotees of motoring are a law unto themselves; sometimes they are to be envied, sometimes not. But to the great majority of owners and users, people of average means, the demands of business are more or less constant during the year; or, if anything, they are more urgent during the winter than during the summer. In that case, where one's office is, there, or at least nearby, must his motoring be also. To these, whose name is legion, the enjoyment of automobiling at least at times during the fall and winter becomes an interesting study.

Outdoor interest is naturally at its height during the first weeks of autumn —now fast passing. Short tours, club runs and social functions of all kinds are always in abundance at this time of the year. The particular mood Nature happens to be in often determines the outcome, but in the main the weather is settled: cool enough for warm clothing, frosty enough for excellent stimulation, and healthful to the ultimate degree. Crisp, cool mornings often merge into unexpectedly warm and genial days, when nothing but the fall harvests and the turning leaves betray to the road user the season it really is. All outdoors is one huge canvas of oils, russets, gold and crimson, cheering to the heart of the traveler while it pleases the eye and rests the brain.

Hills, fields, valleys and streams wear an infinitely pleasing though a somber-growing aspect. The roads, too, are quite as good as at any other season, and not so dusty as in July and August. Some of the country houses and hotels will be closed, but many others, though partially emptied of their summer guests, offer ample accommodations to the tourist and his motor car. In not a few instances this patronage has helped to lengthen the season of open hotels. Society has, of course, re-established its winter capitals in the cities, and various

social functions, club, inter-club and private, are scheduled between now and the nearing season of automobile shows.

He who deliberately throws away his chance for participation in these things is unmindful of some of the best which motoring affords. The record of November, observed with some care for several years past, has refuted those libels of the native poets who, echoing their British brethren, have called November drear and melancholy. Under the refining touch of winds and rains November usually comes a sort of spiritualized October. The sky is what the native poets, echoing again their British brethren, whose island skies are so often gray, are wont to call Italian, though its intense and serene blue is no more characteristic of Italy than of America.

Nothing is more characteristic of early November than its autumnal splendors. Here and there a maple remains like some gigantic fruit just at the perfection of mellowness, but for the most part November's glory is a thing of shreds and patches. A bit of low meadow now and again is alive with crimsons, and no far prospect is without its dim patches of red and gold which seem to promise that somewhere not far beneath the horizon, swift feet might even yet overtake the lost October. Only on the dullest days of winter does the woodland wall take on the dead, cold aspect of the modern steel engraving. Beneath the mid-day sun the November woodland is a great brush-heap of tangled twigs, reflecting the light in mazy sheen from millions of tiny varnished surfaces. Oak woodlands never have so much the air of druidical and hoar antiquity as under the light of a bright November sun.

September is notable for its corn harvest, but for nothing else more than its grapes; the corn and grape belts reach clear across the continent. Butternuts begin to drop, and rivalry brings the boy early out of bed; he foresees the delightful evenings when, around the fire, nuts and jokes are cracked together.

October breaks open the chestnut burrs and shakes down the beechnuts; everything in the woods and in the fields is finding some way to express its happiness. Mostly the crimson and golden apples are in evidence. An orchard is the highest evolution of civilization; it is there that man's work shows at its best. October is a busy month, and our Saxon fathers had a happy habit of naming it a hurry month.

November, the eleventh month, comes in soberly; the days are growing shorter and still shorter. An eight-hour labor law is now an enactment of nature. So far, yellow days, at least days edged with sunshine, have managed to slip in between the storms. Yellow leaves would still occasionally quaver down from the tops of the elms and purple ones from the ashes. But at last the trees stand bare—all except some varieties of native oak and the foreigners, like the English elm and the English oak, which have not yet learned our Yankee ways. They hold their foliage conservatively until the wild storms or the pressure of forthcoming leaves in spring tear it off and send it far afield.

What is done is done; what we have achieved is summed up. The early and the later rain came and the harvests are housed; it is just the time for Thanksgiving. It needed little inspiration on the part of the old Puritans, Winthrop and Bradford, to set aside a day for counting up the good things of the year and giving thanks. How near can a man come to hibernating? Probably a good deal nearer than he chooses. It is just at this point that we have marched off most sharply from our animal sympathies. It is this wonderful power to look ahead and to provide that has so

intensified our living. There is nothing we detest so much as to stop work.

The mellowness of the Indian summer days, when a breeze is playfully blowing the bright colored leaves in a game of "hide and seek," and the sun is beaming with only slightly diminished fervor upon the scene, ought to tempt many motorists to the country. At this season the roads will be found in excellent condition; you will note with a sigh of relief the absence of dust and the non-appearance of that arch-fiend, the mosquito. The genuineness of the pleasure of a brisk drive over a smooth elm-bordered road, the hillocks and curves of which leaves one in pleasurable anticipation as to the surprises beyond, or the long stretch of open country where the wind brings you whiffs of spicy things which the thrifty housewife is putting up in the farmhouse by the way, must be experienced to be appreciated.

As you whisk along past mild-eyed cattle who, only half-accustomed to your method of locomotion, gaze wonderfully after you, forgetting for the moment their toothsome cuds, a flock of birds dart hither and yon with seemingly aimless intent. You watch them wheeling and turning with as much precision as a battalion of soldiers. Their intricate march, if such it may be called, is a marvel of instinct, and each one is fully aware that as soon as the maneuvers are thoroughly mastered and the fibers of tiny wings are sufficiently strengthened, they will sail away beyond the soft fleeciness of white clouds to "far-away." And you know their signal for return will be the repeated message of a wee, gray-coated chickadee that dandelions are in blossom. Soon after they will be heard planning domestic affairs over the lilac buds.

By the wayside are seen piles of red-cheeked apples awaiting their journey to city markets. Meditating upon the old adage about "stolen fruits," you come to a halt and enjoy the thrill of conquest as you climb the aged fence with pockets and hands full of this most acceptable of fruits. Contentedly munching you move slowly along over a rustic bridge which spans a brook and come to a cornfield bright with pumpkins. Hallowe'en comes to your mind and you laugh aloud at old-time thoughts. Ghosts of bygone jack-o'-lanterns dazzle your eyes and strings of popcorn and fat doughnuts dance before your memory. At this opportune moment a quaint old house comes in view and the air is heavy with odors of new pickles and preserves. Impulsively you turn in the driveway and soon are enjoying the good things, moistened with new cider, with boyhood's zest of appetite.

The pleasures of the day seem complete when farther along you come across a party of urchins on chestnutting intent. As they clamor in your machine in response to your hail, their touch of awe for your big monster melts away in the genial breadth of your smile. Fortune favors you again in the location of the trees and, driving through a gap in the fence, you deposit your chattering passengers amidst a generous downfall of nuts which Jack Frost has seen fit to plan for your entertainment.

When the shadows lengthen you start off richer by a big bag of nuts, but richer far in the happy spontaneity of children's gratitude. Presently you run in contact with Nimrod himself, proudly disclosing a bag of game. Gathering him and his bright-eyed hound in, you are regaled with stories of flood and field till the city is reached. Arriving home, you spread out your trophies, now swelled by a brace of fat partridges and, leaning back in your chair before a cheery wood fire, you just smile and smile—and there is satisfaction and peace!

Since the motor car has become a business as well as a pleasure factor, there has been an increase in the number of reasons why its use should be in a sense independent of the seasons. Perfectly independent, of course, it can never be, for our ever-varying climatic influence can never be entirely overcome. But to one who remembers how, even a few years ago, automobiles were seldom seen on our city streets and country highways after the first snowfall, the coming winter, at least, will prove a decided revelation.

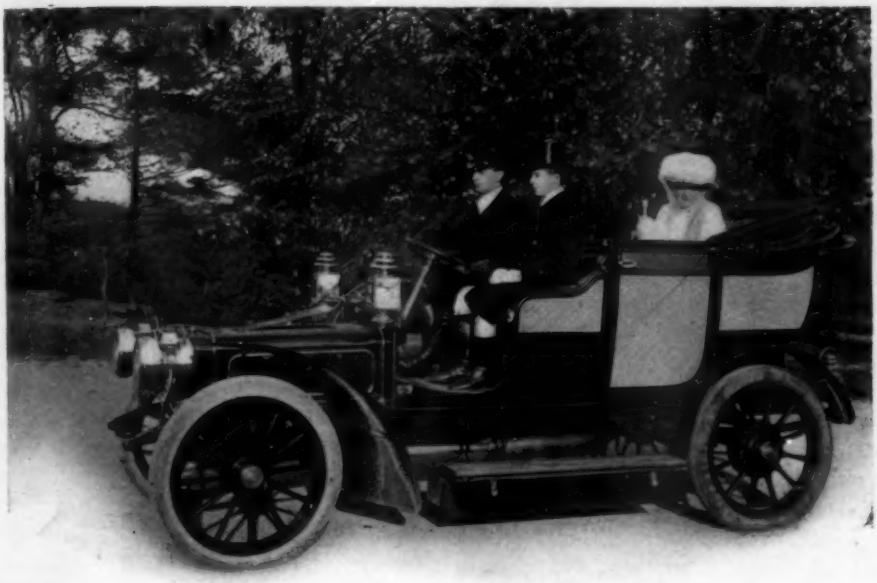
In New York and other seaboard cities there seem to be about as many private cars on the streets from December to March as there are from June to September. This may be due to two reasons; first, the large number of winter days when the principal avenues and boulevards are in rideable condition; second, the fact that the end of the outdoor season brings them all back from tours and resorts alike to town. The few that may be placed in winter storage do not cut any figure in the calculation. New York streets on a fine winter's day must be somewhat in the nature of a surprise to visitors from those inland sections where the average machine is put into winter storage at the first prolonged snowfall, and not taken out again until well into the spring.

Still thought by many to be a summer plaything, the automobile has proven itself to be a winter's necessity. Formerly expected by many people to do little more than carry three or four passengers, it has come to be the means of transporting numbers limited only by the capacity of the "Seeing New York Automobiles" ("rubber-neck coaches" in the vernacular), which, by the way, keep up their regular trips throughout the winter. Even five or six years ago its present status as a carrier of merchandise was a future possibility; now it has become the efficient ally of those whose business it is to transport tons of freight and thousands of packages from one part of the city to another, as well as into the suburbs, in any weather.

Indeed, the motor car may fairly be said to have abolished the old idea of the four seasons so far as local transportation is concerned, and to have aided materially in freeing the suburbs and the nearby country from the same handicap. There is, however, a broad difference between those who keep within the city limits and those who still continue to get out in the country. There are always plenty of days that will try the mettle of the motorist; it is during genuinely winter weather that the boreal blast rift through the ranks, and sharply sort out those in whom the sporting blood runs warm.

Among the many thousands of new followers of automobiling there is certain to be a heavy percentage of superficial enthusiasts and faddists. In the candor of fact, it is probably true that this class outnumbers that of the more adventurous ones, just as the fair-weather sailors and the duck-pond yachtsmen outnumber true salt-water sportsmen, who love the sea when it frowns as well as when it smiles. There should, however, be no quarrel with the June-day motorists, for to get out in a wind blowing fifteen miles an hour, and try to make headway against it, is not unmixed with fun, except, perhaps, for those "strenuous souls" who, says Emerson, "hate cheap successes."

Recognizing all this, and admitting that it does require some fortitude to brunt the northerly blow, the fact remains to be urged that it pays to do so. For the majority of persons much real benefit is to be had from short, well-selected tours under these very conditions, and there is, too, more genuine sport and satisfaction in it. In the first



MRS. LESLIE CARTER IN HER NEW 18-24 DECAUVILLE

place, the defiance and conquest of the elements are worth something; it is a special tonic for nerve-worn and moody men. Such mastery creates exuberance; it adds to one's pride and self-reliance. Deeper breathing is induced, and the needed air is consumed in less time than in the milder season, while the general toning and all-around benefits are greater.

Habitation is the secret of being able to enjoy the automobile when the mercury is seeking to crawl out of the thermometer at the bottom. It is much like taking cold water baths the year around; one must begin in mild weather and persist daily in the exercise. Do not quit at the first sign of frost, but after passing through the balmy weather of September, the crisp and glorious days of October, and the early November chill, keep right along into December. Avoid the miasmatic night air, but get out every day when it does not rain or snow.

The hesitation over going out when the air bites is much like that of a bather before taking a first dip; it requires courage only to venture, and after the first plunge all is easy. Make it a regular thing and the variations of temperature and wind will scarcely be noticed. The result will be a delightful contrast to the shivering misery and dyspeptic moodiness of those who stay too much within doors. Everyone who has tried it knows that a trip of even a few miles in a clear, cold wind will send one home with such an appetite as a cannibal might covet.

Let those who will sing of the glorious summer—of bright blue skies and radiant sunsets, of flower and leaf and balmy breezes. But give me, at least now and then between now and warm weather, the biting air of a frosty night, the steely glitter of winter stars, leafless boughs, a cold moon and a cutting northeaster. Of course, the pleasures of a warm sun and green fields are lacking; one cannot lounge and loaf about as in July. But

the winter landscape has a beauty, a quietude and a consolation of its own; the quickening tingle of the blood and the exhilaration of the crisp air will please many quite as much as the glowing experiences of summer. In some way or other the modern type of automobile—strong and reliable beyond compare with anything that has gone before—co-operates with most of the recognized winter sports. The full import of this may not be brought out for several more years; it is a separate theme by itself.

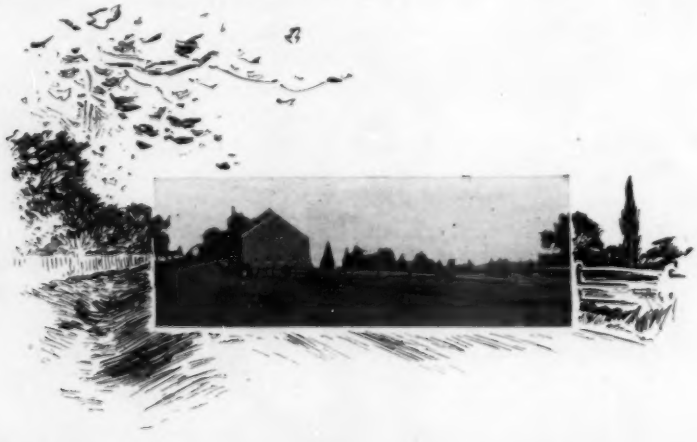
At no period of the year is any worthy performance of a motor car so conspicuous as in winter, or so apt to have the reasonable public attention it deserves. One erroneous impression after another is being done away with by farther use and experiment. For instance, there is less tendency for a rubber-tired wheel to slip on snow than is the case with an iron-rimmed carriage wheel, and, in fact, in dry snow, this tendency is negligible. In melting snow and slush care must be exercised in driving, especially in turning corners, but not more, probably, than in rainy weather—the skidding troubles are less. The possibilities for speed on snow-covered ground have also come to be more generally recognized.

In times past the sleigh has always been associated with winter sport in driving through the country, and it is beyond dispute a fascinating mode of travel. Yet in many respects it has to yield the place of highest regard to motoring. On level ground or downward slopes the sleigh can travel rapidly, while the automobile can rush a hill as readily as whisk along on the level stretches.

I am sorry for the owner who considers it either necessary or wise to store his automobile at the first touch of really cold weather, for it is unnecessary to lose all the continuation of the pleasure which the summer months have given. Just persevere in the determination to take a short initial tour on just the right sort of zero day, and the chances are you will come back a convert, to your great advantage, and be willingly enrolled among those who go motoring in winter. Along with the snows come the shows; then the southern tournaments, and before we know it spring will open the familiar roads to us once again.

What's Needed

"I want to tell yo', my deah brethren," said Deacon Johnsing to his flock at prayer-meeting, and as reported in *Harper's Bazaar*, "dat in dese days of hossless kerridges, an' sich, dat what we need fo' the glorification of de cullud folkses am chickenless coops, razerless pahties, melonless patches and crapless games. Does yo' follow me?"



How to Figure Horse Power

By Terrence Trenholme

Attempting to follow the empirical constants evolved for the steam engine led the pioneer gas engine designers so far astray that one and all dropped them forthwith, and seemingly they, nor their successors, have never come together since. The indicated horse power of any engine is equal to 1-33,000 multiplied by the product of the mean effective pressure, the area of the piston, length of stroke in feet and number of power strokes per minute. In the case of steam engines this is usually expressed by the formula

$$\text{H. P.} = \frac{\text{PLAN}}{33{,}000}$$

in which:

P. Mean effective pressure in pounds per square inch.

L. Stroke in feet.

A. Piston area in square inches.

N. Number of power strokes per minute.

Taking into consideration actual working conditions, and allowing for drop in pressure from various causes, the results of this formula will be found to fall within close limits of error. But with the explosive engine so many disturbing factors are present that it is almost impossible to predict from cylinder dimensions, speed and fuel what power a given engine will actually develop. The most that can be done is to say what it should produce, granted that the numerous conditions of effective working are compiled with.

Assuming a given compression sufficiently short of the practical limit as not to involve any danger of spontaneous combustion, a speed that is neither unreasonably low nor excessively high, that the various parts have been correctly designed, that the mixture is good and ignition takes place at the proper point, that the resistance of the various ports and passages is not so great as to prevent the cylinder receiving an approximately full charge, a formula may be evolved which will, as above mentioned, show the best result theoretically that may be expected from an engine of given bore, stroke and speed.

By omitting the compression factor, the man who reads in a catalogue that the stroke and bore of a motor are of given dimensions, and that R. P. M. are of a specified number, may obtain approximate results by following this simple formula, the calculation in this instance giving the brake or actual horse power.

$$\text{B. H. P.} = \frac{D^2 \times L \times N}{18{,}000}$$

in which:

D. Piston diameter in inches or bore.

L. Stroke in inches.

N. Revolutions per minute.

The denominator varying according to the design of the engine and the character of the fuel.

By assuming a piston speed, this may be simplified to such an extent that, given the piston diameter, what any engine is capable of producing may be known with but little calculation.

General practice in four-cycle engines favors a piston speed of 500 feet per minute, in small stationary and marine engines up to 700 feet, and in automobile motors 800 to 1,000 feet, so adopting 600 feet per minute as a mean, we have

$$\frac{2 \text{ L} \times \text{N}}{12}$$

=piston speed in ft. per minute, or

=600

$$\text{L N} = 3600$$

$$\text{B.H.P.} = \frac{D^2 \times 3600}{18{,}000} = \frac{D^2}{5}$$

in which D, L and N represent the same values as above. Thus with this piston speed the horse power per cylinder would equal approximately one-fifth of the square of the bore. In other words, an engine, with a 5x6 inch cylinder, should produce 5 H. P. at 600 R. P. M., but this is somewhat lower than the speed of the average automobile motor. The denominator four will approximately express the difference represented by an additional one to two hundred revolutions per minute, and the same engine at 750 R. P. M. will produce 6¼ H. P., and so on in proportion as the speed increases.

For gasolene, E. W. Roberts, in the gas engine handbook, gives the following:

$$\text{B.H.P.} = \frac{D^2 \times L \times N}{13{,}500}$$

and this has been found to work out well in practice. But the engine builder who blindly follows any set formula is sure to be disappointed at the concrete result, and the majority of those who have started with a formula as a working basis, toiled over a long and weary road, full of vexatious obstructions before producing a motor that fulfilled expectations to any extent. Formulae, generally speaking, represent maximum values obtainable under ideal conditions, and this is particularly the case where they have not been continually modified and readjusted as the result of experience extending over a number of years, as is the case in automobile motor practice.

When the Governor "Hunts"

With two-cylinder engines it sometimes happens that when they are throttled down to go slow, that the throttle valve while open wide enough otherwise keeps shutting off the flow of gas entirely. To obviate any difficulty of this kind it will be found that a small by-pass drilled in the throttle valve allows the engine to run more slowly. This hole also prevents the objectionable "hunting" of the governor, with the result that the engine runs more regularly. A hole of about one-eighth of an inch in diameter should be quite large enough, but the exact size can only be determined by trial. It is, therefore, advisable to drill a smaller hole and file it out to the required size. To stop the engine when a by-pass is fitted the ignition circuit must be broken by means of a switch, which should be fitted so that it can be conveniently operated by hand.

A Back Number

The man in the Iron Mask pouted.

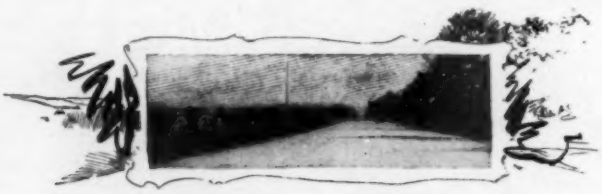
"I don't attract any attention since that automobile racing fellow got on his togs," he wept.

Herewith he regretted he hadn't patented the scheme in the beginning.

His Runabout

"Would you call that automobile he got at such a bargain in Skinnem's Storage Store a runabout?"

"Yes; it will run about ten minutes and then break down for good."



What the Coil Is and What It Does

By Terrence F. Trenholme

IN the sense commonly employed by the owners of explosive engines, the term "coil" applies to the "induction coil," the apparatus used for supplying the high-tension electric spark which ignites the cylinder charge.

The induction coil was originally invented, in more or less its present form, by Rhumkorff, but before entering into any details, it is necessary to explain the fundamental principles upon which the action of the appliance is based, since it is impossible to explain or to understand the complete device unless these vital points are thoroughly grasped by the reader.

The owner of a gasolene engine who is hazy on the subject, and to whom theoretical electricity is not familiar, will do well to perform, on his own account, a few simple experiments, in order that he may comprehensively follow the function of every component of the apparatus to his own satisfaction.

Firstly, get a small magnet, a bar magnet preferably, but if this is unobtainable, a horseshoe shape will do. Fix this magnet as above, and lay a sheet of plain

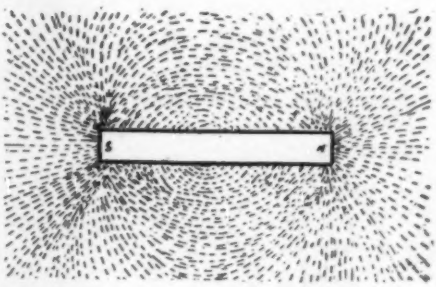


FIG. I

white paper (fairly thin) on the top of the magnet. Now scatter some fine iron filings on the top of the paper, and tap the edge of the paper gently with a pencil or the finger (just sufficiently to make the filings vibrate on the paper). Supposing a bar magnet to have been used, the filings will arrange themselves along regular lines, shown in Fig. 1.

Now push the magnet endways through a piece of paper, so that the

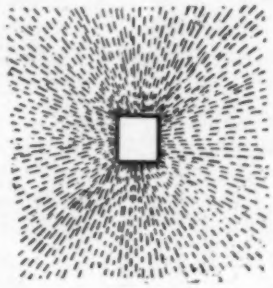


FIG. II

paper forms a ledge of considerable width all round the magnet, and at right angles to it. Repeat the scattering of the filings, and again tap the paper as before. This time the filings will be found to arrange themselves in radial lines around the magnet, all pointing to the center. If a horseshoe magnet is employed for the experiments circles will be found round both poles of the magnet, but congested and distorted in the space between them.

Now, let us consider what these lines indicate and prove. In order that the definite arrangement of the filings could be arrived at it is evident that there must have been some power or force to cause such arrangement, and that this force followed the direction indicated by the filings. What happens is this: the action of a magnet, as is generally known, converts a piece of iron into a magnet too. (Easily demonstrated by picking up a nail on a magnet, and observing that the first nail will pick up a second.) The magnet under consideration converts the multitude of iron fil-

ings sifted over the paper into as many little magnets, which set themselves into the positions to which they are compelled by the big magnet. The first experiment showed, therefore, that the force exerted by the magnet acted along the lines of filings obtained, while the second experiment with the single pole showed that the force emanated radially from the magnetic center.

Now, if these lines are examined they will be seen to travel in curves between the poles of the magnet, and that these curves gradually become of such radii that they are discontinued, and apparently proceed into space, and if the combination of the two visible results obtained be continued, it will be seen that the magnet is enclosed, as it were, in a cage of these lines, traveling from one pole to another.

The filings, however, are only used to make the direction of the lines visible, and to prove their existence, and, of course, there is in reality only an invisible envelope about the magnet within which an invisible force acts upon certain substances, but it has been proved that this invisible force is due to waves in the ether that space is conjectured to be full of. The term applied to the space in which the magnetic action is potent is "the field of force," and the field is supposed to be composed of myriads of "lines of force." For the convenience of terminology, the first is usually spoken of as the "field" of the magnet.

Now we will go a step further, and here the reader will be barred from making his own experiments, unless he has access to delicate electrical apparatus. Faraday found that if he took a coil of wire with a closed circuit (that is to say, one end connected to the other —endless) and a magnet, and he inserted the magnet sharply into the space comprising the center of the coil, an electric current was caused to flow in the coil so long as the motion of the magnet continued, and that a second current was produced, but in the opposite direction, when the magnet was withdrawn. The currents are very small, and a delicate galvanometer is necessary for their detection, but the discovery paved the way for the whole of the modern electro-dynamic machinery, and induced current apparata in use. Identical results were obtained when the coil was moved over a magnet.

We have now got a fact giving a certain amount of relationship between magnetism and electricity—viz.: that motion of a magnetic field (surrounding the magnetic) in the neighborhood of a coil of wire causes an electric current to pass in the wire. It was also found that a coil of wire was itself a powerful magnet when an electric current was caused to flow through a coil which consists essentially of a central coil of wire wound upon an iron core, called the primary winding, a second coil, consisting of very many turns of fine wire, an automatic switch for rapidly making and breaking the current supplied to the central coil, and an appapatus known as the "condenser."

The drawing shows the arrangement of a hypothetical coil, so dissected that the internal parts named above can be seen.

The center *A* is a circular bundle of very soft iron wires, bound together, and inserted in a tube with both ends flat, and projecting from either end of the tube slightly.

B is the primary winding, and is indicated by the *single spiral thick black line*, though, of course, it consists of many turns of wire in reality. The wire with which the primary coil is wound is of a good thickness, and well insulated, so as to permit of a considerable flow of current at low voltage through it.

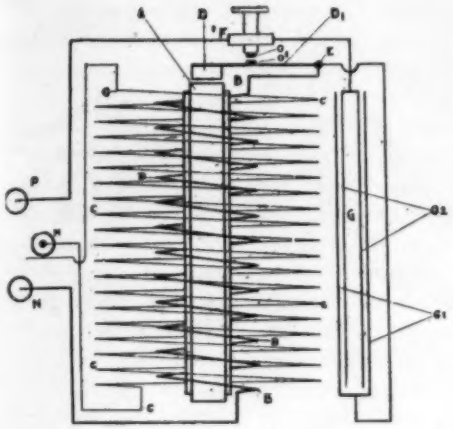


FIG. III

C is the secondary wire, denoted by the fine black spiral line, and this again is only shown as single coil for the sake of simplicity. The secondary winding comprises many thousand turns of a very fine insulated wire, wound in a series of layers, each layer being carefully insulated from the next, the object in obtaining so many convolutions of wire being to provide a large number of sections to be cut by the fluctuating lines of force from the central or primary coil, for, as we have seen, the greater the number of coils to be cut by these lines of force, the higher the voltage of the induced current will be, and a high voltage means a powerful spark between the points of the ignition plug.

D 1 is the trembler blade of the contact breaker, and consists of a soft iron disk *D* attached to the flat spring *D* 1, which is fixed at its other end to the insulated terminal *E*. This spring is free to vibrate, therefore, with *E* as its fixed point. Half-way along its length, the spring *D* carries a little disk of platinum *O* 1, and this platinum is exactly opposite to, and in contact with, a platinum pointed screw. The platinum point is seen at *O*. This screw is insulated by means of the bridge *F*, which forms its nut, and whose feet (not seen in the figure) form terminals for the connections to it.

G is the condenser, and *G* 1 and *G* 2 are the separate series of elements. This condenser is made of a series of sheets of tinfoil, insulated from each other by means of paper soaked in paraffin wax. The method of manufacture is somewhat as follows:

The sheets of tinfoil are cut into the form of rectangles, but smaller than the sheets of paper, so as to leave a border all round each metal sheet. One side of the rectangle is, however, left with a tag on it in the shape of a ribbon, and in building up the condenser a sheet of paper is first laid, then a sheet of tinfoil, but placed this time so that the tag projects from the opposite end of the paper. This method is continued throughout the whole assembling of the condenser, and it is not hard to see that by this arrangement every alternate sheet of tinfoil has its tag at the same end. These tags are all connected together at either end, and wired for connection to their correct terminals.

The precise action of the condenser is too involved to fully explain it here, but its function generally and its particular necessity in connection with an induction coil must be stated. A condenser is essentially an apparatus for the "tem-

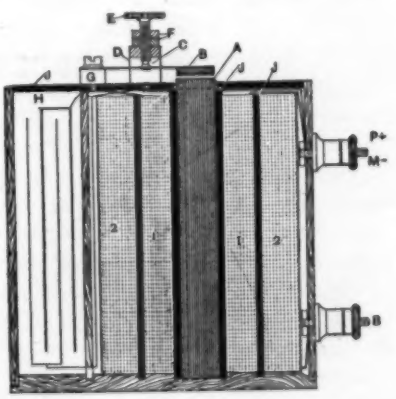


FIG. IV

porary" storage of current, which it is capable of refurnishing again instantaneously, its precise relation to, and the necessity for its presence among the component parts of an induction coil being as follows:

When the flow of the current is broken in the primary coil, the converging lines of force cause a strong current to flow in the secondary coil, and, as we have already seen, a coil with a current flowing through it, is itself a magnet, and has a separate field of force of its own. The current induced in the secondary winding is, however, itself momentary, and as this current dies away together with its field, the returning lines of force, cutting, the coils of the primary winding, cause in their turn an induced current in the primary coil to flow, and the condenser is fitted in order to absorb this induced current, and to give it out again to help the current from the batteries in re-magnetizing the iron core of the primary winding.

The three small black circles represent the terminals of the coil. *P* is the positive terminal to which the positive wire (technically called the "lead") from the battery is connected; *N* is the negative terminal, and *H* is the high-tension terminal, to which the heavily-insulated wire to the spark plug is attached.

Thus, to trace the condenser circuit, the current from the battery originally passes from *P* to *F*, thence through the platinum points *O* and *O*1 to *E*, through the coil *BBB*, and back again to the battery through *N*. In doing this, two things happen: First, the central soft iron core *A* becomes magnetized; and, second, an induced current is caused to flow in the secondary coil *CCC*.

The magnetism of the core *A*, however, causes the iron head *D* on the trembler blade *D*1 to be attracted to *A*, and thus break the primary current.

Directly, however, this current is broken, the field about the coil *B*, which in spreading caused the induced current in coil *C*, almost instantaneously collapses. In doing so it causes a second and stronger induced current to flow in *C*, but in the opposite direction, and, further, induces a current in the coil *B*, also to the opposite direction to the former current in the battery.

The condenser is connected with the ends of the primary coil by its separate sets of tinfoil leaves or plates being joined up, one to *E*, and one to *F*. So that when the current induced in the primary occurs, it passes from the upper end of the coil to the plates *G*1 of the condenser, through *E*, and to the set of plates *G*2 from the other end of the coil, through the earth terminal *N* to the battery, through the battery and battery lead to *F*; hence to the condenser plates *G*. While this is going on, the trembler points *O* and *O*1 are out of contact. It must be understood that the condenser does not actually complete the current, since the plates of it are insulated from each other. It simply acts as a storehouse for the current till the points *O* *O*1 come together again, when it is returned along with the battery current through the coil *B*, thus aiding it in re-magnetizing the core *A*.

The next two figures show an actual coil in sectional plan and elevation, and after the above description it will be sufficient to enumerate the various constructional components.

A is the central soft iron core, made of many straight lengths of iron wire, and bound together by the insulating tube *J*. *I* is the primary coil, consisting of turns of insulated wire of about 16 gauge, wound in several layers, each layer being separated from the next by an interposed sheet of paper soaked in paraffin wax. This primary coil is cased in a second ebonite tube *J*, and the sec-

ondary coil 2 surrounds it. This coil is constituted in the same way as the first, but involves many thousand turns of very fine wire, 36, 38, or 40g, having double silk-wound insulation. More care is taken also in insulating each layer from the next.

Of course, each single strand of wire comprising the coil is in itself a magnet, and surrounded by its own field, so that the field of a coil may be considered to be a combination of smaller fields, and it can easily be seen that the greater the number of these small fields the more powerful their combination will be in its magnetic effect. Obviously the simplest way to increase the small fields is to increase the number of sections or turns of wire in the coil. The same thing applies to the coil providing the induced current.

If only a single section, or turn of wire, formed the coil, the current induced and the voltage of the current would be infinitesimal, but the greater number of the turns the greater the voltage of the current produced.

The current is produced on account of the formation of a magnetic field surrounding the wire and the section of lines of force, so that in order that the maximum power of the induced current may be attained, it is essential that the maximum number of lines of force must be cut within the active magnetic field.

One more point. The magnetic action of the coil is found to be greatly enhanced by winding it upon a soft iron core, due to the fact that this expedient collects the lines of force from the coil, as it were, and presents them spreading further. It utilizes the lines passing through the space inside the coil, which would otherwise be useless, by absorbing them and becoming a magnet with a field of its own, thus strengthening that radiating from the coil. Both a coil of wire and soft iron, however, have the property of losing their magnetic conditions almost instantaneously, directly the magnetizing influence is removed, and obviously their field of force, which is, however, as rapidly regained.

If, therefore, a coil of wire wound on a magnetic core be imagined to have the magnetizing electric current rapidly passed and interrupted, the reader will form an idea of the magnetic lines of force suddenly enveloping the coil to their fullest extent, and as suddenly vanishing again, like a bladder alterately distended and allowed to collapse completely. Now, if this first coil be imagined as surrounded by another having a large number of turns of wire, and so arranged that the greater part of the magnetic field of the

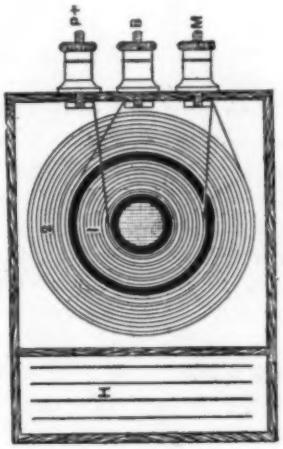


FIG V

first passes through it, it will be seen that, directly the current flows in the first coil and the field of force from it springs up, this springing up or distension of the force will cause immense numbers of lines of force to cut the numerous sections of wire as the motion proceeds, with the result that an electric current is "induced" to flow in the secondary coil, and this continues until the magnetic field of the first coil is stationary. Directly the current ceases to flow in the first coil, the magnetic field, in vanishing,

cuts the coils of the second winding again, and a current is induced, but which flows in an opposite direction to the first.

Thus it will be seen that the making and breaking of a continuous current in the central coil induces an "alternating current" in the outside winding.

The composite coil is placed in one compartment of a rectangular box, and the condenser *H* in a second, the cover being formed by an insulatory plate *J*. *G* is the fixed end of the trembler blade, of which *B* is the soft iron head. The contact points are indicated by *C*, and the bridge *D* carries the trembler adjustment screw *E* and the lock nuts *F F*.

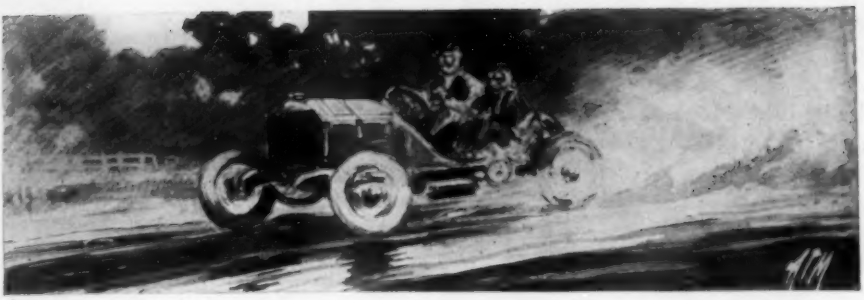
The condenser *H* is connected between the pillar at *G*, and the bridge *D* inside the casing.

There are three terminals to the case *P M B* indicating positive (+), masse (—), and bougie, respectively (these are the letters commonly found on French coils). In the elevation, *P* and *M* fall one behind the other, and only one is capable of being shown. *P* is connected to the bridge *D* inside the casing; one end of the primary coil goes to *M*, and the other to *G*. The high tension coil has one end attached to *B*, and the other to M. These connections can be plainly seen in the plan, but are somewhat difficult to trace in the elevation. The terminal *P* is always connected with the battery lead, and *B* with the sparking plug, but the terminal *M* is connected with some metallic part of the frame, which acts as a return path both for the low tension current to the battery, and for the high tension current from the plug.

Thus even supposing there be four coils in one case, one end of each of the primary coils would go to a single terminal, and one end of each of the high tension coils would go to the same terminal, so that a single lead from this central binding screw would do all the "earthing" required.

Causes of Muffler Explosions

Muffler explosions are due to the presence of an unignited charge from a previous stroke of the engine. When a charge is not fired in the cylinder through the mixture being faulty, it is then passed into the exhaust box, where it is ignited by the heat from the box, or by the next hot exhaust gases. The remedy is to have some control on the governor so that when you desire to coast the governor will not permit the engine to race, and entirely cut out, or close the throttle, since its doing this destroys the mixture, except in the case where a good type of automatic air valve or automatic carbureter is fitted. Such a valve gives a perfect mixture at all speeds, although when the throttle is almost closed, and it is suddenly opened, or vice versa, there is sure to be a tendency to produce an occasional explosion in the exhaust box.



Some Carbureter Essentials

By James R. Alison

IF the cylinder be the heart of the motor, surely then the carbureter can fairly be regarded as the lung thereof. Upon the proper performance of the carbureter depends the success or reverse of the motor. It is all so very simple this carbureter problem that one wonders, until experience teaches its sad lesson to the contrary, why the thing should be considered a problem at all.

Briefly, nothing more is required of a perfect carbureter than it allow the engine on the suction stroke to take into the cylinder, at all speeds, a full charge of maximum weight and of the best proportions for obtaining the maximum power. Bearing this in mind, the chief features of a perfect carbureter would be:

1. Absence of throttling or wire drawing under all conditions.

2. The provision of the best firing mixture under all conditions.

3. The maintaining of the charge at as low a temperature as possible without allowing freezing to occur.

To comply with the first essential, no part of the air passage through the carbureter should be of smaller area than that of the effective opening of the inlet valve, and the shape of the passage should be such as to put a minimum of resistance on the passing air. That is to say, the passage should be straight, and as far as possible smooth, while the sum of the areas of the various air intakes should be more than equal to the area of the valve opening.

To comply with the second requirement, the so-called "automatic" carbureter has been produced. The chief condition affecting the carbureter in this respect is variation of pressure in the carbureter chamber due to variation in engine speed, throttle opening, etc. The chief reason for this is a very simple one. The air being an elastic fluid varies in weight, decreasing with the increase of suction, while the weight of the gasolene is constant. There are other reasons, but this is the main one. The result is that when suction is high too much gasolene is taken from the jet, and vice versa.

There are then two types of automatic carbureters:

1. That in which the air supply is varied as the suction and pressure varies.

2. That in which the fuel supply is throttled or baffled as the suction increases, the air intake being fixed.

In the variable type it is obviously advantageous to have as small a number of air intakes as possible—preferably only one. This means that the air intake should be located behind the jet. There are two ways of accomplishing this.

The air intake may be varied at the jet or at some distance from it. In the first method, the velocity of the air passing the jet is kept high, and an ejector effect is set up, which draws the gasolene from the jet, and causes it to be violently broken up and well mixed. To obtain this, the area of the passage for the air past the jet must be varied according to requirements. In the second instance, the gasolene is drawn from the jet merely by a vacuum and falls, dripping out at the bottom of the carbureter. Experience shows that accurate control in such a case is difficult.

In the second type of automatic carbureter (with a fixed air intake and variable jet), it is clear that the fixed passage through the carbureter must be quite as large as the effective opening of the inlet valve. For good starting, then, the bore of the jet must be large. It is obvious that the control of the bore of the jet is most delicate—the chief point against this type. In some types the carbureters have obstructions in their jets, which prevent the too rapid flow of gasolene at high speeds.

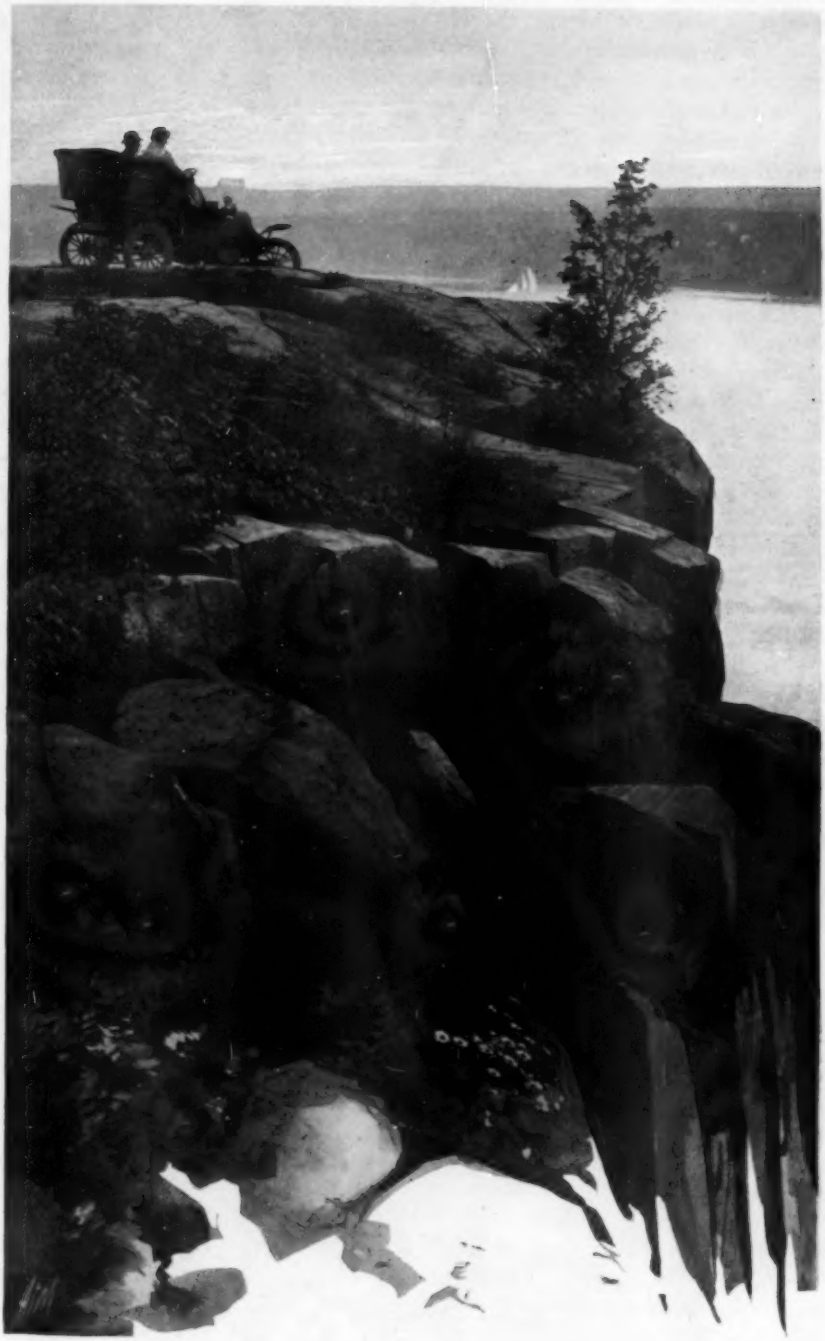
With any automatic carbureter the mistake is often made by the user of fitting the carbureter without adjusting it to the engine. Users are under the impression that if it is "automatic" it is bound to do all that is required of it. Not so, however, and in any case, there should be an adjustment on the automatic device which is adjustable while the engine is running, as many are not. This adjustment is very necessary to cope with variations of levels with different gasolenes, variations of atmospheric pressure, due either to altitude, weather conditions, or both; variations in the composition of the fuel, and for discrepancies in manufacture.

The automatic device must be actuated by the variation in pressure in the spray chamber. This alteration in pressure is brought about by variations in throttle opening, engine speed, and the number of cylinders being supplied. If, then, the automatic device is controlled in any way by the speed of the engine, or in conjunction with the throttle, correct results under all conditions cannot be obtained, though an approximation is realized which gives fair results over a certain range.

A glance at the accompanying diagram shows how untrustworthy any such approximation can be. This curve, which represents pressures obtained by firing fuels of various proportions at atmospheric pressure, shows that the same amount of work can be obtained from two fuels, the one containing almost exactly double the amount of gasolene to the other.

The third requirement, that of maintaining the charge at as low a temperature as possible, is important if best results are to be obtained. When volatilization occurs the temperature in the spray chamber falls. This causes the aqueous vapor in the passing air to condense, and, unless steps are taken to prevent it, to freeze and choke the passage.

To prevent this, either the spray chamber is jacketed, and the cooling water or exhaust gas circulated through it, or the air drawn in is warmed. Of these methods, exhaust gas jacketing seems by far the best. The amount of heat passing can be controlled, while with the warm water jacket considerable time is needed to warm the carbureter up, the jacket is liable to burst from freezing, and the joints must all be water tight. In any type of jacketing, only those parts should be jacketed where freezing occurs, in order not to heat up the charge unnecessarily. For this reason taking the air in warm is not the best method, though it is the simplest. With small engines, warming of any



ON THE PALISADES

kind has been found superfluous if the carbureter is sheltered behind the engine, as it is on a motor cycle. Employing any warming method in such cases is a useless complication and a power waster. It will be seen, then, that the necessity of warming is due to the presence of water in the charge. Apart from any possibility of freezing, the presence of water in the charge is bad.

The gasolene should be fed into a well, with an outlet therefrom to the float chamber through layers of gauze. The bottom of this well should be detachable, so that water and dirt collecting in the well can be removed. The passage from this well to the float chamber should be rather large, for obvious reasons.

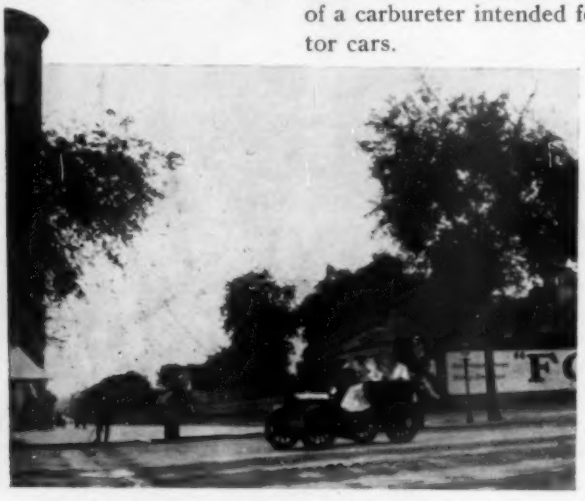
The float is generally the most unreliable part of the carbureter. To overcome leakage troubles, it has been suggested that the float should be of cork, covered with graphite, and copper plated.

The passage from the float chamber to the jet should not be led from the bottom, as by not doing so insures that any grit, and especially gummy deposits which may have gravitated there will surely be left behind. To prevent this foreign matter returning to the needle valve seat, a slight wall may be raised round the seat. The passage to the jet should, of course, be of large bore and be easy to clear.

The jet should be easily removable without the necessity of taking any other part of the carbureter down. It is an advantage to make the jet of large bore almost to its tip, where it is drilled as required.

As the carbureter is not stationary, but is tilted in different directions, it is an advantage to have the jet in the center of the float chamber. Then tilting of the carbureter has no effect upon the level of gasolene in the jet. In all such cases, however, the top of the jet is high above the level of the gasolene, and consequently starting is not easy. The central position of the jet does not seem of very great importance, and excellent results can be obtained with the jet close up to the float chamber. In such cases, the carbureter should be set across the car with the spray chamber on the right-hand side.

The foregoing does not, of course, profess to deal with the subject of carburation scientifically, but only to set out some of the practical requirements of a carbureter intended for use on motor cars.



"Dished" Wheels; Advantages and Reverse

By Prof. James Hunsicker

MOTOR car wheels are constructed either of metal or wood, the former having wire or tubular steel spokes. The wire spoked wheel is fast falling into disuse, except for very light cars, where saving in weight is the chief consideration. The main objections to the wire wheel are its inability to withstand lateral shocks and the frequent attention necessary in order to keep it clean and free from rust. To these may be added, lack of spring or give, necessitating the use of pneumatic tires and good spring suspension. Against these objections, the wire spoked wheel, however, possesses the advantage of cheapness, ease of repair, lightness, and of the fact that such wheels may be set straight on their axles, and not splayed outwards, as must be done with "dished" wheels. In England, more than anywhere, prejudice against wire spoked wheels is very strong; in fact, it is the demand of the English buyers in this respect that has increased the use of wood wheels abroad and here. It is now recognized almost everywhere that, for the English market, wood wheels are essential. This is not easy to understand, since the wood wheel certainly introduces complications of its own.

A wood wheel, if made perfectly flat, *i. e.*, with all its spokes in the same vertical plane, possesses little or no lateral stability; in fact, it has less than a wire spoked wheel. To compensate for this, the wheel is "dished," that is to say, opposite spokes form an angle at the hub, so that the wheel assumes a shape somewhat similar to that of a dish. It can easily be seen that the majority, if not all, of the lateral strains are taken up by the outside of the wheel; thus, if a car slides against the curb, for example, the outside of the wheels receive the impact; just as when rounding a curve the tendency is for the inside car wheels to leave the road, and for the whole lateral strain of rounding the curve to be borne by the outside wheels. All such strains tend to thrust the dished or conical wheels "inside out," having the effect of converting the lateral strains into strains of compression along the length of spokes—strains they are best prepared to meet.

To put a dished wheel upon an ordinary axle, however, would be to place it so that the mere weight of the car, to say nothing of the vertical shocks transmitted from the vehicle body of the wheel, would be sufficient after a time to cause the wheel to collapse. To overcome this the axle is dropped at the ends, so that the wheels are given a slant outwards at the top, the bottom or working spokes being so brought directly beneath the hub and vertical with the ground line.

Increased lateral strength is the main object of dishing wheels, though some other minor advantages are also attained, since the wheels are made more resilient, and if, in shrinking on the metal rim, the rim should not be a good fit, the "dish" is merely slightly increased or decreased. Still, a "dished" wheel is at a disadvantage in striking an object in front of it, or in surmounting inequalities of the road. For this reason horse-drawn vehicles equipped with iron-tired wheels have them slightly inclined inwards forward, so that the spokes in front may be in the best possible position for meeting any strains to which they are likely to be subjected in this direction. The inclination of the axle-tree to give the wheel this position is called the "lead" of the axle, and in practice is very slight. It is doubtful, however,

whether wheels are ever so set on vehicles with rubber tires.

The amount of dish, and, therefore, of outward inclination of the wheels must depend upon the probable strains, *i. e.*, according to the total weight and speed of the vehicle. The front wheels of automobiles are, or at least they should be, always "set" in accordance with the above rule, but with the back wheels the transmission difficulty steps in and prevents this, so that the rear wheels are generally flat, or very slightly "dished," the inclination being ignored. It is for this reason, partly, that in a smash one rarely sees a front wheel broken. Many attempts have been made by Daimler, Gautier Wehrle and others to provide means whereby the rear wheels might be dished and splayed outwards, but the complication which at once resulted has always caused the attempts to be regarded as failures from a practical point of view.

It has been suggested that to get the best results, wood should be used for the front wheels, and wire-spoked wheels for the rear, a remedy which even if it were efficacious would still very seriously detract from the car's appearance.

The general practice appears to be to make the spokes of oak and the felloes of ash, and to have more spokes in the rear wheels than in the front wheels to compensate for the natural weakness of a flat wheel.

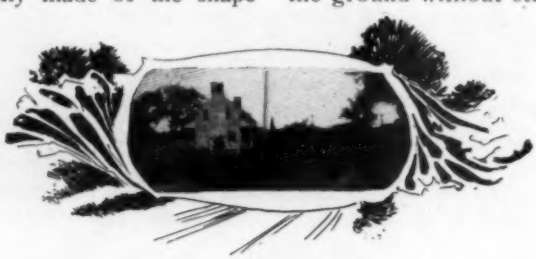
The tubular steel wheel suffers in the same way as the wire wheel—from excessive rigidity—though lightness and strength are points in its favor. This wheel is generally made of the shape of a wire wheel; that is to say, "double dished," and may, therefore, be put upon a straight axle.

A consideration of the sizes of wheels is important, inasmuch as the present tendency is towards fitting small wheels —at any rate, to cars having "live" axles. There is one distinct advantage in using wheels of large diameter, since such a wheel bridges over small inequalities in the road, while the small wheel has to sink into the inequality and finally rise from out of it again. A small wheel, since the car has to be lifted out of each hollow in the road, absorbs more power than a large wheel, and is not nearly so comfortable on a bad road.

A large wheel is more resilient than a small one, and since it revolves much slower than a small one, very naturally decreases the wear and heating of the tires—an important consideration on a fast car. On the other hand, the small wheel is stronger and lighter proportionately than the large wheel, and provides a lower center of gravity for the car.

By making all the wheels of equal size, it is only necessary to carry one spare tire in case of a breakdown; but the practice often followed of taking worn-out tires off the rear wheels and fitting them on to the front wheels is not to be commended from the point of view of safety. A burst tire on a front wheel is far more serious than a burst tire on a rear wheel.

If a flat-treaded tire is fitted to a dished and splayed front wheel, the tread should be beveled to come in contact with the ground without strain on the tire.



Considered as a Public Service Possibility

By Albert E. Rothermel

THE future of the automobile rests largely upon the car's ability to take its place in the world's work as a safe, economical, speedy, inexpensive and not too complicated conveyance of passengers. To meet the requirements of this sort of transportation motor cars must be reliable and simple, powerful, economical in running, and with all working parts accessible.

Low cost of upkeep is absolutely essential, since on this, combined with good management, depends the whole secret of successful working.

The cars must be free from odor and vibration; handy to control and operate, while combining low first cost with comfortable riding and good appearance.

Upholstering should be of a sanitary material, preferably cane sprung.

A large number of vehicles, and a spare one for every three in use, should be the rule where the cars are intended for public service.

The general specifications to meet the foregoing essential requirements would seem to call for a good substantial engine wherein all the working parts are adjustable with the minimum of trouble and expense. Water cooling on the thermo-siphon system with fan behind cooler. The cooler to be readily getatable so as to clean through the tubes, the engine water jackets also being made so as to be scaled when required to keep up cooling efficiency to what it must be.

Magneto high tension and ordinary tension ignition as a stand-by and for easy starting.

Pressure feed to carbureter, so that tank can be stowed away beneath body, and also a spare tank can be carried.

Gauge glasses to indicate gasolene and water, with good taps to cut off at will.

Float feed carbureter with the jet central with float, or so arranged that gradients do not affect carburation.

Fully automatic carburation is not absolutely essential, though it would be desirable.

Automatic lubrication throughout the engine and transmission system.

The transmission must be of a type so that the engine can always, if necessary, be used as an additional brake, i. e., the gears should be made so that slipping or missing gear is impossible. The transmission arrangement should be flexible, so that any frame distortion due to full load, or an unusual stress, cannot cause binding of the bearings.

Good springing.

All the brakes should be secured to the rear wheels so that no braking action could go through the differential gear or joints. The brakes should be balanced with ratchet sprags fitted to both rear wheels to prevent running back on hills, and should be of a simple type, so they could be put entirely out of rubbing action when desired. Brakes should have no rattling tendency, and should be metal to metal, following locomotive practice. Their diameter should be large and they should hold equally well both ways.

Large filler to all the tanks, in fact large enough to insert the hand and arm to reach all parts; they should be of the spring lid type, with funnel strainers in position.

All water, gasolene and exhaust pipes should be well stayed, and gasolene leakages on to the exhaust pipe or box guarded against.

A mud shield should extend underneath the whole length of the car, and

chain cases should be provided where chains are used.

Clutch metal to metal, self-adjusting, mechanism should be fairly high from ground, especially where water has to be passed through and boulders avoided.

The cars should be all-weather ones, with as little polished and plated work on them as possible.

Steel disk wheels, which are much cleaner and do not present a bad appearance, might be employed advantageously.

Cars must be capable of being washed down with a hose without damaging or forcing grit and mud in the bearings.

Steering all enclosed, irreversible and adjustable in all directions.

All parts interchangeable where possible.

A tool case with necessary parts and tools on every vehicle.

A good tire with non-slipping tendency, and having a long life with good resilience.

Given these, and they are easily obtainable, in a car there is no reason why the automobile should not quickly become a formidable competitor to the trolley car and a valuable feeder to the railway with these very great advantages in its favor.

Such an automobile could at once take up its own position in traffic and not monopolize the center of the road. It has no unsightly wires or poles, and causes no disorganization of business by upheaval of the streets when a new service is inaugurated.

Less capital is required for a given carrying capacity than by any other means, while its use permits of a lower cost of upkeep for roads, and consequently lower taxes.

There is no danger of disembarking passengers being knocked down by other vehicles, as the motor vehicle takes up and puts down passengers at the roadside.

There is no danger to other wheel vehicles from raised or sunken tracks.

One vehicle can pass another when full, the rail car cannot.

No danger of death from falling wires.

The rule of the road can be observed.

The service can be run to any part, including outlying districts, and if one route does not pay, the service can be diverted at any time without loss.

No risk of tying up the whole service as when a central station breakdown occurs in an electric car system.

Smaller staff required to handle.

Better returns for capital expended.

The automobile has the advantages over steam railways in addition to some of the foregoing that with its use there is no monopoly of the country, no bridges to increase the cost of haulage. Less capital sunk. No danger from sparks of passing engines. Nor is it necessary when privately used to run on a schedule, hence business can be transacted more expeditiously with the automobile than with the train.

Testing the Batteries

By Remington Vernam

ORDINARILY when reference to the testing of a storage battery is made, one or other of two very different operations is meant. From a scientific standpoint, a test is conducted with all possible accuracy for capacity, efficiency and specific gravity of acid under various conditions. From the automobilist's point of view a test is simply and solely his rough and ready method of estimating how far the accumulator on his car is likely to take him before giving out. With such different objects being sought for, it is strange that the same measuring instrument should be used in both cases, and yet for the most part this is what is done.

It is perfectly natural that he maker of a scienific instrument should do all in his power to make that instrument as accurate as possible, and therein exists much of the trouble. The car owner certainly wants an instrument which in one way is accurate. That is, it must always give the same reading under the same conditions, yet he has not as yet been given an instrument by which he can read "capacity" direct. The nearest he has is the "voltmeter," and in the desire for accuracy it is forgotten that "voltage" is not the final aim and object of a motorist's test. The voltage of an accumulator varies with the current which flows; the greater the currrent, the lower the voltage. What automobilists really *want* is a measure of the voltage under normal working conditions of current flow. What they actually *get* is a measure of the voltage when practically no current at all is flowing. These two are very distinct, and consequently the results are sometimes more misleading than useful.

In all, automobilists have the choice of three types of testing instruments—voltmeters, hydrometers and lamps. The latter can lay no claim to scientific accuracy. If of low resistance, lamps undoubtedly are capable of giving a very rough estimate of capacity. But as has been already stated, in at least one respect accuracy is necessary, and when it comes to this, lamps are not satisfactory. In different lights, it is impossible to judge of the brilliance of the glow given by the filament of a lamps; at night it will appear far brighter than during the day. Hence the lamp test cannot be considered as affording a reliable indication of the battery's capacity.

The hydrometer is undoubtedly of value. But it is only of use if employed very systematically and regularly, and ignition accumulators do not adapt themselves to its use. The hydrometer consists of a graduated glass tube, terminating in a small weighted bulb. When placed in the electrolyte, the level, to which it is immersed, gives a reading of the specific gravity of the acid. It is well known that during the discharge of a cell the specific gravity of the acid drops slowly and steadily, and in this lies much of the value of the hydrometer test, the proper method of applying which is as follows: A thirty ampere-

hour cell is, say, 1.22, as measured by the hydrometer. The cell is steadily discharged at a constant rate of current through a resistance, an ammeter being, of course, kept in circuit. For the sake of illustration, suppose the result of the test to be as follows:

Rate of discharge two amperes.

Time in hours.	Voltage.	Specific gravity of acid.
0	2.10	1.22
2	2.05	1.206
4	2.03	1.193
6	2.00	1.180
8	1.97	1.166
10	1.84	1.153

At 10½ hours the voltage drops rapidly.

When plotted on squared paper, the result at once shows that the specific gravity curve, with which we are chiefly concerned, is so very near a straight line that it may be plotted as such.

This curve may be cut out and attached to the side of the accumulator, being protected by a coat of varnish or of celluloid dissolved in amyl-acetate. Now as to its use. Whenever the accumulator has been charged, the specific gravity must be tested. If found to be wrong, it must be corrected, if the reading is too high, by the addition of distilled water; if too low, by the addition of sulphuric acid. In adding the necessary liquid, it must be remembered that the water, being lighter, will tend to lie at the top, and unless stirred will take several hours to mix thoroughly with the dilute acid, tending to make immediate readings unreliable.

When it has been definitely ascertained that the gravity of the electrolyte is correct, the cell may thereupon be put into use. Suppose that it be subsequently used for ignition purposes for a length of time, and it becomes desirable to find what charge it still holds, the hydrometer now gives, let us say, a reading of 1.186. Referring to the curve, you find that this corresponds to about five hours, so you at once know that the cell is only half discharged. In order to be on the safe side, however, you should remove the cell to be recharged, when the reading shows about 1.165.

The chief difficulty in the way of the use of a hydrometer is that the plates of the average ignition battery are so tightly packed that the acid is very inaccessible. It can, of course, be sucked out by a small pump or by a pipette, but for handiness in use it cannot at present compare with a voltmeter. An improved form of hydrometer is made, which is rather more convenient than the one usually supplied. In the improved hydrometer a small tube contains colored balls, which float or sink according to the gravity of the acid in the tube. This makes the test rather less troublesome, but in return therefor gives only rough results. It would seem possible to fit at a small cost a little transparent compartment at the side of a cell, containing a hydrometer of sufficient accuracy. This, however, would only be practical in the case of the large batteries supplied for cars, rated at forty ampere-hours and upwards. A four-volt battery of this type could have two of these little hydrometers, and, once they were fitted, they would be exceedingly useful for more purposes than one. Firstly, the specific gravity of the acid in an ignition battery is apt to increase very rapidly, owing to the evolution of gas during charge. The instruments would register this increase, and the acid could be kept at its correct specific gravity without trouble. This in itself would be a great advantage. In the second place, readings could be taken properly at any time without separate accessories; and, thirdly, any difference in the condition of the two cells forming the battery would be readily noted, and a faulty cell dealt with before it had deteriorated too far. The extra cost involved should not

IN GLORIOUS CALIFORNIA

amount to but very little, if any, more than one dollar for each battery, and the voltmeter might easily be dispensed with. If preferred, the two hydrometers in their transparent vessel might be carried separate, though it would thereupon become necessary to lead the acid through pipes fitted with some form of tap and union and to provide means of blowing the acid back into the cells. It may be that the general opinion would be against any increase in the size of the battery, but the compensating advantages appear to be such as to warrant at least some consideration. Indeed, in batteries with wooden cases it is doubtful if any increase in size at all would be necessary.

The most popular testing instrument with automobilists at present is undoubtedly the voltmeter, though, as frequently constructed, it is too often both unreliable and misleading, since in its planning and production a great deal too much has been sacrificed to obtain a compact and light instrument. Another point is that almost all voltmeters constructed for practical or experimental work only give readings when the current is passed through their coils in a certain direction. The "watch" voltmeter usually reads the same whichever way the current flows.

Anyone who examines the construction of pocket voltmeters will find that in most cases the winding is very crudely done, and the scale from which readings are taken is printed. Such an instrument must of necessity be inaccurate. The only hope of attaining accuracy with it, when the coils have been carelessly wound, would be to calibrate by comparison with a standard instrument, and the printed scale at once shows that this precaution has not been taken.

The result is that the readings of two out of every three pocket voltmeters now on the market are, on the average, half a volt wrong, on the useful part of the scale. If they read too high—which seems to be more often the case—the inaccuracy may have some very unpleasant consequences for their trusting users.

A voltmeter is usually designed so that its scale may give clear readings at or about a certain value, say, at four volts. It quite often happens, however, that the readings around two volts cannot be accurately taken, because the scale divisions come too close together. Again, many voltmeters give inaccurate ratings owing to a false zero reading which is another very grave fault.

In most cases, voltmeters are constructed with a long coil of very fine wire giving a high resistance. The object of this is that (1) unless the resistance of the voltmeter is high, the readings are not scientifically accurate, and (2) the higher the resistance of the coil the smaller the current which passes through it. For these reasons, it has become generally recognized that all voltmeters must be of high resistance. In applying the voltmeter to the special needs of the automobilist, no attempt has been made to adapt it to its new surroundings, the necessity for which is at once made evident when the peculiar characteristic of all secondary batteries, known as "recuperation," is taken into consideration. To take a possible instance: At the end of a run, the voltage of one cell of an accumulator may be in reality 1.7 volts. Directly the engines are stopped and the accumulator is rested, the voltage rises instantaneously to 1.8, and in the course of half a minute to about 1.9. Next morning, if the cell is tested before starting the motor it may read 1.98, or even 2 volts. This rise in voltage is very transient, and before two miles are covered by the car the voltage will be back at 1.7, and the cells will hold out just long enough to allow the driver to get an inconvenient distance from home. Now, if the voltmeter were wound with a coil of low resistance, allowing about half an

ampere of current to pass, its needle would not remain steady when the reading was taken, but would drop slowly as the current flowed. At the end of about half a minute the needle would become steady, and the true voltage could be read. This instrument, as already stated, would lack scientific accuracy, but still it certainly would give a very fair idea of what might be expected from the cell. An alternative method would be the use of a low resistance test lamp connected in shunt with a high resistance voltmeter. By this means, the advantages of both test lamp and voltmeter would be combined. By the use of the hydrometer in conjunction with such a voltmeter a great many of the troubles arising from inefficient accumulators would be avoided, as cells could be easily kept in good condition, and ought to last for several years without serious deterioration.

Why It Can't Lose

By "The Observer"

THE points of superiority upon which the motor-propelled commercial vehicle makes its claims for superiority over the horse-drawn conveyance to a progressive age and people are briefly as follows:

It is considerably cheaper for transport.

It is more expeditious in delivery of goods.

It has a larger range of action.

It is a first-class advertising medium.

It can work at its maximum all day, every day, and even longer if necessary.

It can do more work than any horse, and a single car can replace, in fact, as many as seven horses. It does not require days of rest between two hard days' work. When not in use it requires practically no attention and no keep.

It only takes fuel when actually working, and does not eat its head off in the stables; after standing without work it is not given to being frisky and hence dangerous to property and life. With a car work can be done at the highest pressure, and no charge of cruelty to animals can be brought in.

The fuel used is to do useful work, and the work done is a measure of the cost.

The speed can be accelerated in case of need to at least four times that of the horse.

It does not die suddenly.

It can be manipulated with much greater ease and certainty, and in cases of emergency can be stopped in a space equal to its own length when traveling at a speed of ten miles per hour, without excessive exertion on the part of the driver.

Only half the room is required in traffic, it can be manipulated more readily than any horse, and can travel safely at four times the animal's speed. Thus it will be seen that if motor traffic were universal in our large cities, the street obstruction problem would be solved and blockades cease to exist.

Less damage to the roads, since with the car the action is a rolling one, and tends to smooth and level the surface instead of breaking it up, as the pounding action of horse's hoofs must always do. The enormous charges on the taxpayers for street repairs and cleaning would be considerably reduced.

Mud and dust accumulations would be considerably reduced.

More sanitary, as unburnt gasolene vapor and lubricating oil are gaseous, innoxious, and quickly disappear, while the solid excretions of the horse are per-

manent, unsanitary and dangerous to human life.

Less attention and stabling cost.

Less storage room, and no manure heaps.

It does not run away, kick, or shy at strange objects or passing trains.

Can anyone deny the modesty or the truthfulness of the foregoing claims or, admitting them, question the certainty of the motor car's speedy and complete triumph in the realm where so many years the horse has been supreme?

Rusted Rims Are Expensive

Rust brings destruction to tires quite as quickly as it does to the metal parts of a car. Many a tire is cut and ruined by rims which should have in the first instance been carefully painted and upon which no tires should have been placed until the paint had thoroughly dried. In removing a tire from the rim and putting it back again the paint upon the rim is certain to suffer more or less injury. The places where the paint is thus removed, whether on the inner edge of the rim or on its outer edge, should not be allowed to remain bare for an indefinite period, but, as opportunity occurs, should be painted over with some air drying enamel, after the spots had previously been cleaned up with a little worn emery cloth. If the bare places are allowed to remain and the water gets to them in the wheel's passage through the mud, rust starts and eats its way into the canvas and rapidly rots away the fabric, with the result that the neglect of a little thing like a rust spot in the end causes the payment of a big bill for it in the shape of a new tire.

MR. AND MRS. SILAS P. WOOD IN THEIR ELBERON VICTORIA, WHICH IS A WIDELY KNOWN CAR ON NEW JERSEY ROADS

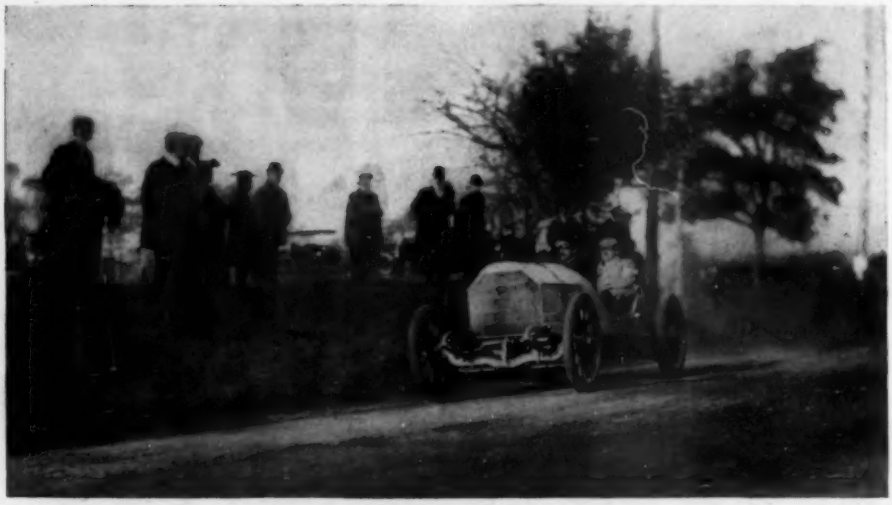
The Second Vanderbilt Cup Race

By Robert Bruce

A MOMENT after Hemery and Heath rushed across the finish line, close together, within a half hour of noon, on Saturday, October 14, winning a double victory for France, a "flash" of the name and time of Hemery, the winner, was sent by special cable arrangement to Paris. This must have meant a lot of "extras" on the streets of the gay capital during the evening—our afternoon by difference in time—and it is easy to imagine a rekindling of the old-time enthusiasm throughout that country by the news that the skill, luck and industry of France had once again triumphed in a real contest of nations.

In the same breath here—and doubtless also abroad—was the eager question as to what the French club would do next year with the Vanderbilt trophy; for, as a party to changing the Gordon Bennett cup from a racing to a touring emblem, and having declared well in advance that, even should this contest be won, no effort would be put forth to continue the series, France has made at least a formal abandonment of road racing from this time forward.

Whether or not this decision is final is now a very live question on two continents. To bring a world trophy across the Atlantic, and not defend it from challenges representing other nations, is asking great forbearance from any sporting temperament. That America, having now made one creditable showing at the finish of a contest of first magnitude, will make a supreme effort to bring the Vanderbilt cup back to this country, can scarcely be doubted. Large questions of business interest, of sport and national pride are deeply involved, and it is safe to say that all these

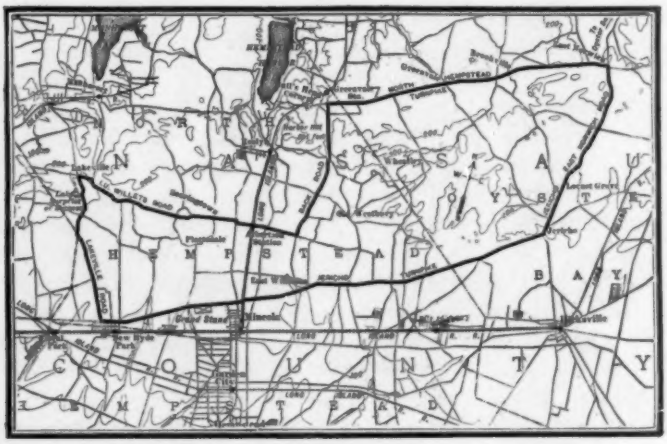


W. K. VANDERBILT, JR., AND THE SURGEON

will be more emphasized a few months hence than they are now.

Whatever may be the outcome of this unprecedented situation, either here or abroad, one thing will always be remembered in connection with the second Long Island circuit. It established road racing in this country on the best European standards and gave third place to an American car and driver. Out of our common roads, and entirely within fifty miles of our largest city, has been found a course capable of an average speed surpassed only once in the whole history of the sport.

With all the glamor and romance that we associate with the great French contests, not one of them ever exceeded this one in speed for an equal distance, though the average over the Brescia circuit, for the Florio (Italy) cup was slightly higher. A popular object lesson has been given the American people as to the speed and power of the modern automobile, the larger interest following which (some good; some bad) will be far-reaching.



MAP OF THE COURSE

If all that has been printed about the cup race could be made into one column, it would doubtless reach around the entire course. Instead of repeating in our briefer space the

details of the contest—which were in every newspaper the same afternoon or the next morning—THE AUTOMOBILE MAGAZINE gives herewith the pith and kernel of the whole in separate items. These are the points that describe and record the essential features of the race:

The distance, 283 miles, was ten times around a circuit of 28.3 miles, laid out somewhat irregularly in the northwestern part of Long Island, the four principal points making same being Lakeville, East Norwich, New Hyde Park and Jericho. Though near New York, this section is thinly populated, and after thorough oiling and some repairs on the roads, the course was very fast, as the records show. The total distance of 283 miles is the exact mileage from the Harlem river to Syracuse, N. Y., by the New York Central R. R.

Hemery made the ten laps in 4 h. 36 m. 8 sec., winning the race by a well-sustained high speed, without sensational spurts. Had the course been along the line of the New York Central, and the Empire State Express started from the Harlem river with Hemery, when he reached the finish at Syracuse the crack train of America would only have been pulling out of Utica, 53 miles from the finish. With this exception: that had the course been as straight as the railroad, and the right of way equally secure, the racing car would undoubtedly have increased its lead by a number of miles.

Lancia, the chief dependence of the Italian team, made faster laps than Hemery, and took by a good margin the records of the course. He led to and through the seventh round, when he stopped for tire changes and gasolene. Leaving the gasolene station he was run into by Christie and lost a half hour getting ready to run again. Notwithstanding this he finished fourth, amid great applause, as his terrific speed was the sensation of the day. Only the special short runs of our famous railroad flyers ever equal his pace in covering this circuit in a few seconds over twenty-three minutes.

Of the American team only Tracy finished at all, and he won third place as Hemery had taken the first, running fast

CHRISTIE MAKING THE TURN

CROWD AROUND LANCIA AFTER RACE

and strong throughout. A fine round of applause greeted his appearance each time in front of the grand stand. His total time, only twenty-two minutes more than Hemery's, was very creditable. Dingley, Lyttle and White were lost to the interest of the spectators after the first few rounds, and while a little special sentiment attached to Christie, there was a general feeling after his collision with Lancia, that his was no car for such a contest.

Of the German team, Jenatzy cracked two cylinders early in the race and retired. Foxhall Keene, the American amateur who entered his own car in this team, ran exceedingly well until he was put out by collision with a telegraph pole in taking a curve at too great speed. Basle did not start, and the two others, like the other Americans, were soon lost to sight. Nor was any special attention given to the Italian or French drivers who had fallen behind the leaders, whether still in the race or not.

Probably twenty-five thousand people came to Long Island to view the race, including hundreds of automobiles, which were "parked" in every conceivable place for miles around. Most of the island population turned out, some to view the race, but probably more to separate the visitors from their money. Not a few of them have probably laid in their winter's coal and provisions, perhaps even raised the mortgages on their homes and farms by the results of their day's work. As usual, the Long Island R. R. failed miserably to carry the crowd, its principal morning "special"

TRACY AT THE LAKEVILLE TURN

NAZZARO AT LAKEVILLE

taking nearly three hours to make less than twenty miles. Once stuck on a slight grade en route, it was necessary to send back to Long Island City for a pushing engine.

The grand stand, for which the last box and individual seat had been sold, was representative of the wealth and fashion of America. Absolutely perfect weather prevailed throughout the day. The race was run practically without serious accident of any kind. Neither Christie's collision with Lancia nor the partial wreck of Keene's car killing or maiming any person. A few careless pedestrians were bumped by a few careless drivers of visiting machines, but that was all. The only serious accident happened to a party leaving New York for the course, and that within the city itself.

Owing to the fact that the circuit was covered on an average of less than thirty minutes by all the cars that ran at all well, the spectators were kept at close attention throughout the entire contest. The signalling and announcing, as well as the policing of the course were well done, something was going on every minute, and the less than five hours passed quickly.

For a long time after the finish the crowd surged up and down in front of the press and grand stands, gradually disappearing by every means of transportation back to New York. There was a constant procession of automobiles all the way from Mineola to Long Island City, where a string of them blocks long waited the chance to cross the ferry to Manhattan. Meanwhile the people of the island were generally engaged in taking their annual inventory.

Following are the figures as taken by the official timers for each contestant, on each lap. Lancia's slow time in the eighth lap is accounted for by his tire and collision troubles:

ELAPSED TIME OF THE CONTESTANTS BY ROUNDS.

No. Contestants.	1st round	2d round	3d round	4th round	5th round	6th round	7th round	8th round	9th round	10th round
	H M.S.	H.M.S.	H.M.S.	H.M.S.	H.M.S.	H M S.	H.M.S.	H.M.S.	H M.S.	H.M.S.
18. Hemery	28.23	54.24	1.21.20	1.58.38	2.23.27	2 48.55	3.14.20	3.39 59	4.08.33	4.36.08
14. Heath	28.02	55.03	1.21.56	1.48.51	2.15.21	2.41.54	3.10.50	3.44.41	4.11.41	4.39.40
7. Tracy	28.14	56 51	1.25.27	1.57.58	2.25.18	2.58.11	3.25 04	3.36 56	4 28 53	4 58.26
4. Lancia	23.49	47.20	1.10.45	1 34.03	2.02.05	2.25.50	2.49.52	4 01.09	4.25.09	5.00.31
10. Szisz	24.55	49.24 1-5	1.14.45	1.53.27	2.22.45	2.56.09	3.24.46	3.53.41	4.34.07	.....
8. Nazzaro	25.28	1.18.42	1.44.17	2.08.52	2.37.56	3.04.03	3.28.40	3.53.20	.....	.....
20. Sartori	27.41	55.11	1.22.20	1.49.53	2.21.06	3.02.38	3.56.27	4.34.10	.....	.....
9. Warden	27.41	55.07	1.22.30	1.49.45	2.25.46	3.05.19	4.11.18	4.51.23	.....	.....
2. Duray	26.26	56.17	1.21.57	2.07.43	2.33.12	2.59.27	3.35.55	.....	.....	.....
5. Keene	27.21	54.24 2-5	1.23.05	1.54.10	2.20.33	.....	.....	.....	.....	.....
16. Chevrolet	28.42	56.57	1.28.32	2.07.25	2.38.41	.....	.....	.....	.....	.....
3. Dingley	29.44	1.00.55	3.42.33	4.21.35	4.57.20	.....	.....	.....	.....	.....
19. White	51.31	1.36.23	2.18.54	3.09.14	.....	.....	.....	.....	.....	.....
15. Lyttle	29.15	2.00.17	2.35.49	3.15.52	.....	.....	.....	.....	.....	.....
1. Jenatzy	24.52	49.25	1.22.06	.....	.....	.....	.....	.....	.....	.....
6. Wagner	24.56	49.49	1.30.38	.....	.....	.....	.....	.....	.....	.....
11. Christie	58.08	1.28.20	2.44.30	.....	.....	.....	.....	.....	.....	.....
12. Cedrino	25 36	53.54	.....	.....	.....	.....	.....	.....	.....	.....
X. Campbell	28.21	.....	.....	.....	.....	.....	.....	.....	.....	.....

THE TIME OF THE FINISHERS BY ROUNDS.

		1st	2d	3d	4th	5th	6th	7th	8th	9th	10th
Hemery (18)	80 h. p. Darracq	28.23	26.01	25.36	38.18	30.49	25.28	25.25	25.30	28.39	27.30
Heath (14)	120 h. p. Panhard	28.02	27.01	26.53	26.55	26.30	25.33	29.05	33.32	27.10	27.59
Tracy (7)	90 h.p. Locomobile	25.28	31.23	28.36	32.11	27.40	32.59	27.53	30.51	31.58	29.27
Lancia (4)	120 h. p. Fiat	23.49	23.71	23.25	23.18	28.02	23.45	24.02	1.11.17	23.51	35.31

Tips for the Tyro

By A. Garrager

TO wrestle with the intricacies of an automobile alone and hence unaided is the lot of many a man who through necessity becomes the pioneer in the new method of locomotion in his vicinity. To win the mastery of the motor costs him many an anxious moment, and often not a few good American dollars, yet given patience, coolness and a fair general knowledge of the car the becoming of a passable driver thereof without the aid of a teacher is not nearly as difficult as it may seem to those who have not tried it. Here follow about all the really essential things one has to remember and to do to handle a car properly:

Always see that water and fuel tanks are full, that the lubricators are charged and acting, and that there is a sufficiency of oil in the crank chambers.

Before starting the motor be sure of the following:

(1) That the brake is on; in most cars this is applied by pushing the brake lever forwards. In a few cars the brake lever is pulled towards the driver.

(2) That the change-speed lever is in the "out-of-gear" notch; this is generally the second notch on the segment counting from the back.

(3) That the throttle is open.

(4) That the switch is on and the ignition retarded; this is most important.

(5) That the gasolene tap is open.

(6) That the supplementary air inlet of the carbureter is shut.

Turn the starting handle from right to left slowly at first. When the motor is running, advance the sparking until the explosions from the engine are sharp and short, and the governor cuts in and out regularly. Then open the air inlet of the carbureter, and manipulate the throttle until the motor is working at its slowest and most silent point.

Get into the seat, place the left foot on the clutch pedal. Push the change-speed lever into the first or second notch forward of the neutral position. Release the brake lever.

Allow the clutch pedal to rise slowly under the left foot, at the same time pressing the accelerator pedal with the right foot to give the motor a chance of picking up speed. When the car is under way, release the accelerator and allow the motor to turn at its lowest speed and least noise. To gain speed press the accelerator pedal.

To change speed, declutch by slightly depressing the left pedal, then push the change-speed lever one notch forward and allow the clutch to slowly slip in again. To drop to a lower speed, declutch the motor and allow the car to slacken its pace before pulling the speed lever one notch back. It is easier to change from a low speed to a high one than from a high speed to a low one.

To reverse, press on the clutch pedal, wait until the car has come to a complete stop, and then pull the speed lever towards you and into the last notch. Lift the left foot gently and the car will at once start running backwards. Do not use your brakes more than you can possibly help. A good driver releases the clutch immediately he sees a necessity for slowing down, and does this some time before it is actually necessary, calculating on the momentum of the car to carry him up to the point at which he must stop. A soft touch of the brake pulls up the car without jerk or jar. The man who rushes up behind a vehicle and jams on the brake suddenly is not a good driver. He injures the tires much more than is apparent at the time and is classed by really good

THE FAMOUS WINTON TRAVELLING EXHIBIT

drivers as an incompetent. If a mechanic is addicted to this habit the owner will do well to warn him at once that if he continues in his bad habits he will be discharged. The man who does not have to pay for the tires of a vehicle is the one who is inclined to treat them badly. A tire should always be pumped up hard—it wears better, punctures less frequently, and lasts much longer than if soft. A common belief exists among chauffeurs that a soft tire is less liable to puncture, but that belief is the outcome of laziness.

Aids in Discovering Ailments

The best method of getting at an unknown trouble, loss of power, for example, is to figure out the different probable causes of the trouble one by one. By proceeding in this logical fashion the cause of the difficulty can always be quickest found. After trying and renewing, if necessary, the inlet valves, do likewise with the exhaust, and while with the exhaust examine the timing and make sure that this has not been interfered with. Next pass on to the batteries and see if they are fully charged, or at any rate, if they are showing four volts. Many a time have weak batteries been found at the bottom of an "unknown trouble." Unless the car is missing fire badly, the contact may be left alone, as this cannot alter; but, of course, if the car has been in other hands, it is well to see that the firing cam is correctly set. The carbureter is an article which, unless it is either stopped up, or floods, cannot alter itself, though a thorough cleansing of it with gasolene is, however, a very good thing.

Same Thing

"Say, give me a synonym for 'expert,' will you?" said the new man, nibbling his pen.

"What are you writing about?" asked the other.

"Expert testimony as to the best automobile."

"Oh, the word 'conflicting' amounts to the same thing."

The Electric's Charge

Chauffeur—I have run you another ten miles, sir, and I would like my pay.

Passenger—What? Why, this automobile is advertised to run forty miles on one charge.

Chalking an Inner Tube

By "The Repairman"

CHALK is a lubricant used to lessen the friction caused by the rubbing of the inner tube of a tire against the outer, and this friction is considerable. The movement of the car causes an intense heat inside the tires. Chalk is necessary to counteract these evils, as there is no inner tube which could resist them alone. It also is of help in putting on a tire, while at the same time it prevents to a great measure the wrinkles that sometimes form on the inner tube.

But be moderate in the use of chalk for whatever purpose. It is a fine powder which penetrates very easily into the pores of any body with which it comes in contact. Of course when too much is used the chalk accumulates. With the inflating of the tire and the motion of the car this accumulation filters through the outer tube and detaches it. This happens in a dangerous place, to the right and left of the line which touches the ground, just where the tire bends as a result of the movement of the car, and these parts are continually bending and unbending. A sort of bellows movement takes place inside the tubes and the chalk is blown to these places continually. It thus begins to detach the outer tube, the piling up becoming so vigorous that the mass of chalk forms a crust which at once cuts the outer tube. The edge of this cut, hardened and held apart, clips the inner tube, a very serious thing, as the two together very soon cut through the canvas of the outer tube.

Even if the chalk has been evenly distributed inside the outer covering, an excess will have the same disastrous results, because in putting on the outer tube the movements necessary cause a fall of the chalk which accumulates when it meets resistance. This happens in the lowest part of the tube and there the mass is formed.

How then is chalk to be used and in what quantities? In putting on a tire at a garage, it is necessary to have five or six pounds of chalk. Before putting the inner tube in place, roll it thoroughly in the chalk; then shake it in the air to get rid of any superfluity. When on the road, put in the curve of the outer covering a little chalk, which must be carried with you, then slowly turn the wheel two or three times, striking the outside at the same time with the palm of the hand. Then, stooping, hold in the left hand the outer tube opened at a place nearest the ground, and with the right hand carefully throw out all the accumulated chalk. This is a most essential precaution.

If you have been traveling on wet soil and fear that the outer tube is damp inside, it is better to apply the chalk to the inner tube, as it will gather in a ball in damp places. To do this, roll a clean rag in the chalk and then pass it over the tube; when the surface is soft and slippery to touch, it is then sufficiently chalked.

If a puncture should occur or any other accident, you might want to get rid of the chalk on the inside (or part of it) of the outer tube. Some chauffeurs wash it off with water. This causes mouldiness, and sometimes the rotting of the canvas of the outer tube, as the water takes too long to dry and the tire is exposed for too great a time. To get rid of the chalk first rub dry the interior of the outer tube, and then, for the surplus, soak it in wood naphtha or ordinary alcohol. Before going any farther, it is necessary to allow about half an hour for the alcohol to dry.

Do not use benzine or gasolene, for

either of them softens the rubber and so causes trouble. Do not forget that the surface must be perfectly dry before the patch will stick well, or other repairing is done.

Neglected Car Heating

It is surprising to the seeker after motor car comfort to find early in his search that so few firms have devoted time to the perfecting of heating devices for cars during their winter use. The exhaust from the motor contains enough heat units to keep every passenger in the car the motor drives at a summer temperature, if the heat was only properly used. One novel method of car heating was perfected and patented by a large garage and repairman in a western city. Beneath the footboard and flush with the top of the car floor he placed a galvanized iron air-tight pan as long as the car was wide, say twelve inches in width and one inch deep. A similar pan was placed in the floor of the car in front of the rear seat. The exhaust pipe from the motor was tapped and an elbow inserted. From the elbow a pipe led into the box on the front footboard. The box had a vertical partition extending from one end to within one inch of the other. This partition, dividing the box or pan into two equal compartments, also directed the exhaust gases, which entered one compartment at one end, flowed through it into the other compartment and from there escaped out through a pipe that joined the heater to the muffler. In a two-seated vehicle the exhaust, after passing through the front seat heater, was conducted directly to the rear seat one, and thence to the muffler. This device, while the simplest of the simple, seemed to be effective, while initial cost was small, the heater did not occupy any useful space, and best of all did not cost one cent for operation.

Secondary heaters, which are those that have first to be heated and then give out their heat for two or three hours, are the ones most winter drivers use, where they use any at all. Many of these heaters are excellent for a cold day, but they have the disadvantage of cooling off towards the end of the run when heat is most needed. At other times, when scarcely any warmth is required, they cannot be stopped from radiating heat. Against these defects the secondary heaters possess the qualities of cheapness and convenience. Limousine cars and Pullmans offer exceptional opportunities for good heating, but in most every case it seems that the heavy sides and seats of these cars have made the builder feel that additional heat is not necessary for the comfort of those who ride in them. In most cases this view of the makers is the correct one, but if the introduction of heating devices will aid in popularizing the automobile for winter use, then they should be installed.

Personal News and Views

WHEN it comes to an inconsequential thing like automobile racing and the "governing" thereof, what has anything so ancient as the English language got to do with it? Nothing at all, according to those responsible for the now world-famous "elimination trials" of the Vanderbilt Cup race. According to that eminently non-sporting volume, the dictionary, elimination is defined as "the act of getting rid of or casting out; especially, the expulsion or ejection of the worthless." Of course, the dictionary, as I have noted above, is not a sporting publication, and cannot, therefore, be expected to know anything about the correct definition of this word, never having consulted that very learned body, the Racing Board of the Automobile Association of America, as to the word's real meaning. Had the dictionary been acquainted with this triple A body of sportsmen and philologians it would have declared the definition of elimination to be "the act of getting rid of or casting out a man after you have got his money; especially, the expulsion or ejection of the worthy."

The gentleman with tallow legs who believed he could safely walk through sheol with them had a cinch on succeeding when compared to the chance the competitors in the famous "elimination trials" had. Briefly stated, the only way the "eliminated" cars could win was to lose, and the only way they could lose was to win. I don't know just why or how this was so, but that is what results prove the committee decided. In even plainer language this wonderful board or block decided that in a race the man and car which failed to finish stood a far better chance of winning the event than did the man and car which did finish. Isn't that real cute? Had the "trial" been a "race," the learned committeemen in charge would, if they were foolish enough to follow their own rulings, have awarded the place prizes to the cars which failed to finish and disqualified the cars which did finish, because the ones which did not finish were more likely to win in some subsequent race in which they would not have to compete against the cars which had fairly and squarely beaten them. Well, that kind of logic is too much for me. I'd give three dollars in great big pennies, though, to see that famous committee render this won-

derful decision of theirs in a horse, foot, flying, sailing, swimming, walking, rowing, skating, running or shooting "elimination trial," if the decision was made where the public could get at the committee for just a few brief moments.

YEARS ago, before I had reached the age of discretion, I made an exhaustive and expensive study of the law of chance. Like not a few others, I had the idea that I had arrived at a position in my studies where I could with impunity back my deductions with my ducats. I did, but there was something wrong with my knowledge, and my ducats paid for it. Despite all of this and the fact that the early frosts of life's approaching winter have made the sporting blood run sluggishly in my veins, I really would very much like to bet about twenty-five or thirty cents of genuine money that not once in a green moon can four numbers be placed so they cannot be identified and four men pick them out the same way twice hand running, yet this is the miracle which was performed in the Automobile Club of America on the occasion of determining the order in which the contestants were to start in the race for the Vanderbilt Cup. The New York *Sun* thus describes the performance:

"The allotment of team places was done by a double drawing, the first performed to decide the order in which the representatives should draw. First, Robert Graves, representing the German team, drew and got No. 1. Next, Baron Adrien de Turckheim drew No. 2 for the French team; then E. R. Hollander, acting for Italy, drew 4, and last, A. L. Riker drew No. 3 for the Americans. The second drawing was what determined the order in which the teams will start. Mr. Graves again drew No. 1, Mr. Riker then pulled forth No. 3, and Baron de Turckheim again drew No. 2, Mr. Hollander picked out what was left, No. 4."

Verily, the age of miracles has not passed, and truth still remains the superior of fiction—that is, if the foregoing story of the "drawing" is the truth.

It has been suggested that if the prices for assorted live stock of the smaller varieties continues to be advanced by the honest farmer in his claims against the automobilist for damages alleged to be done to the farmer's chickens, dogs, ducks, geese, etc., that it will be far cheaper for the automobilist to carry an assorted cargo of birds and beasts with him when he travels away from bricks and mortar. By means of these replacements the motorist could save considerable money, though I fear he would not at the same time add anything to the high esteem he is now held in by the honest farmer before mentioned.

Of amateurish drivers
I know two kinds—just two,
They're those who can't and do not,
And those who can't and do.

WONDER why it is that it is deemed necessary by some exponents of the art of fast driving to always pose before the camera in an inartistic imitation of a mixed-ale fighter? A half-burned, half-masticated cigar butt aggressively protruding from the off side of the poseur's mouth may seem to him to be the very acme of real devilishness, but to most people it tells a story which is by no means complimentary. Take men like Tracy, White, Dingley, Nutt or Roberts, and add to them every sin-

gle one of the foreign cracks, and you won't find among the entire aggregation any but a quiet, gentlemanly lot of men, who would as soon think of being pictured with a cigar butt projecting from their faces as they would of loudly proclaiming their own greatness as drivers. While religiously refraining from demonstrating in anything more daring than "exhibition" driving, the profession of guiding a high-powered car at top speed on the road where alone it can be driven at top speed, calls for the greatest possible nerve, determination, bravery and self-control, hence it is that anything akin to cheap braggadocio on the part of these buttsters comes to you in the nature of a distinct disappointment, they constituting the few exceptions there are to the almost universal rule of the quiet gentlemanliness of the crack racing men. It is this unusualness which makes the cigar Indians so very noticeable and so very offensive.

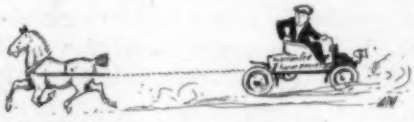
ABOUT this time of the year, says the almanac of automobiling, look out for anti-freezing mixtures. Well, just to make your looking a little bit easier, here are three guaranteed preventatives of frozen water jackets and feed pipes:

1. Use a mixture of four parts water and one part wood alcohol. The difficulty with this method is that the wood alcohol tends to evaporate out from the water and has to be replaced from time to time.

2. Use a nearly saturated solution of calcium carbonate. The weakness of this solution is that it has a slight tendency to corrode the metal it comes in contact with.

3. Use a mixture of four parts water and one part glycerine, to which should be added about pound of ordinary washing soda for every ten gallons of the mixture, to correct a slight tendency toward acidity from the glycerine.

There you are—a trinity of anti-freezers; each one of which, as a matter of fact, can readily be frozen if exposed to a low enough temperature, but not one of which is likely to freeze at a temperature above zero Fahr. If a mixture is desired for a temperature below zero try adding wood alcohol to the third mixture. Any one of the three mixtures will give satisfactory results, but in my judgment perhaps the third is the best. I have had no experience with this, but I believe it would give good results.



AMONG the not altogether unnatural misconceptions of an automobile on the part of the public, brought about by the accidents and wild cavortings of high powered cars on the highways, is that mechanical and animal horse powers are both the same. In other words, that a hundred horse powered auto car, for example, has in some mysterious fashion got boxed up within its motor the same power that the vehicle would have if it were being drawn by one hundred horses in place of being propelled by a one hundred horse power motor. Of course, this is not so.

One mechanical horse power is the energy transformed in doing the equivalent of lifting 33,000 pounds to the height of a foot in a minute's time. A strong horse working for eight hours a day can exert continuously from 27,000 to 30,000 foot pounds a minute, according to the best authorities; but—and herein lies the falsity of most comparisons—a powerful horse can, when required, exert as much as ten mechanical horse power for a limited time.

Thus, to get the maximum power of

ten horses, a hundred horse power gasolene engine is needed, since these engines are almost always rated at their maximum output. Furthermore, there is a considerable loss of power between the engine and the road, often as much as twenty per cent.; so that to get the equivalent of our four horses in maximum drawbar pull would require a still larger engine.

The steepest hills are usually met with on the worst roads, and, as a bad road affects the tractive power of an automobile much more than it does that of a horse, in the hundred horse power machine there might be only fifty horse power available for lifting the heavy machine up the hill—the equivalent of a good, strong four-horse team working to its fullest capacity.

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"MADE in Germany," has for many years been a legend which, when applied to goods of any description, has been thought to speak more of the cheapness of the wares thus labeled than for the merits thereof, but, strange to say, this is very far from being the case with automobiles. Here we find that the "made in Germany" label is accepted as an unquestioned badge of superiority in all that goes to make a car expensive, hence, exclusive. This year the Paris sales agent of the famous German cars, claims to have sold over $4,000,000 worth of them and he says he expects to exceed this very large sum by another million dollars more before the season of 1906 has come to an end. It looks as though he really might do this, since he has already ordered 864 chassés from the Germans, and of that number has sold prior to their delivery 600, leaving his total risk for an entire twelve months to come the sale of only 264 which in the light of the figures given seems as near to a certainty as anyone would desire. I'd like to have a slice of this "made in Germany" pie for mine, if I had any choice when the good things of life were being handed out by whatever power attends to such matters. Speaking of pie, imagine how the French automobile makers must enjoy seeing their dear friends, the Germans, leisurely departing with this $5,000,000 piece of pastry!

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USUALLY I am not a very firm believer in trying to get something for nothing. You can always succeed in getting it where advice and such like unpleasantries are sought for, but where you look for real value free you invariably fail to accumulate anything more precious than that wholly unappreciated valuable experience. There are, however, exceptions to all rules, and I am indebted to Mr. A. R. Pardington, of the New York & New Jersey Telephone Company, 81 Willoughby street, Brooklyn, for proof that even the something for nothing impossibility has a very valuable and desirable exception. Due no doubt to Mr. Pardington's well-known interest in automobiling, the telephone company have issued with their compliments the best and most compact map of Long Island roads that I have seen. Any one is at all interested in how to go and where to go on Long Island, no matter whether by automobile or other less pleasant means of travel, who hasn't a copy of this map safely put away where it can be consulted at a moment's notice, deserves to lose half the pleasure of his trip, and will. This map, while it is his latest

gift to automobiling, is not all that the automobilists are indebted for to Mr. Pardington, who, by precept, practice and downright hard work, has done more for the real benefit of automobiling in and around New York than any other man I know of.

YOU can not make a pint measure hold more than a pint, and only the fools try to make it do so. In like fashion you can not make a $1,000 automobile look like a $10,000 automobile, and again only fools try to. Why there should be so many attempters of the impossible in this direction in automobiling I am at a loss to understand, but it is an undeniable fact that you can go no place where automobiles are in use—and goodness knows, you don't want to go any place where they are not used—without seeing a small army of would-bes who, after buying a runabout, endeavor by loading it with baskets, big lamps, a cape top, tonneau, and a search light, think, or pretend they do, that the car looks like a big, expensive touring car. But it does not. The only result is to make the vehicle appear like a perambulating junk shop. It ceases to be a modest and serviceable low-priced car, and becomes a thing only of discomfort, expense and ridicule. To me these overloaded make-believes always remind me of a child who has donned its parent's clothes and imagines it looks like a grown-up person.

I do not blame anyone for wanting the finest possible car, to do so is both natural and commendable, but it is a foolish pride and a false economy which causes many to ape those more fortunate than themselves. To me a modest little runabout, well kept and fully equipped as a runabout, is in its way quite as attractive as the finest and biggest touring car. True, it is of a lighter and more delicate type, but that does not make it any the less desirable if that is the only type you prefer or at least can afford. It is only when some poor, misguided owner attempts to fool the public and himself by equipping the small car with the trappings of the bigger one that the result becomes ludicrous. Some one really ought to start a university for the education of people in the eternal fitness of things and make matriculation compulsory on the part of these runabout improvers.

LOOKING into the future is a pleasant thing and predicting what will happen in years to come is also a very entertaining thing, provided you are not around when the arrival of the future makes of it the present. Evidently Herr Vischer, the commercial director of the famous Daimler Motorengesellschaft, has the courage of his convictions, since he has recently gone on record before one of those German scientific societies with a name as long as your arm and a profundity as deep as the sea, as to just what the future of the automobile is to be. As Herr Vischer has had an exceptional opportunity to form a correct opinion in this matter, it may be interesting to know that Herr Vischer de-

clares the future of the industry will be so extraordinary that even those who are now prominent in it have no conception of the magnitude to which it will grow. Old factories will grow and new ones will be erected, so that automobile manufacture will become one of the greatest industries in the world. Bad, indeed, will it be in Herr Vischer's opinion for the nation which does not recognize these facts, and which throttles a young industry by narrow-minded regulations which can only result in forcing both buyers and capitalists to carry their millions to where the industry has been allowed to develop.

Concerning the automobile danger. There is no doubt that the car does become so in ignorant hands only—not by reason of its speed. Driving quickly is not alone dangerous, and speedy driving is necessary, otherwise the motor car has no use. The speed of the motor car will no doubt increase in just the same way as the increase in speed of the railway train, and the speed will eventually reach forty to fifty miles per hour, and this will not be considered extraordinary. This means that cars must be higher powered, and Herr Vischer says he believes that 30-40 H. P. will eventually be the rule for touring cars.

To the question as to whether the gasolene explosive motor would become universally used, or whether electricity would not eventually supersede it, Herr Vischer said that to prophesy was generally an unsafe thing to do, but in this case he said he had very sound reasons for his views and hence did not fear to act the role of prophet. Every source of power that we carry with us on our cars, he said, has a certain weight, and this weight differs but little. Electricity we have to carry about in accumulators, while in the steam car we have the heavy quantity of necessary fuel and water. Only with the explosive motor is this not the case, because with it ninety-five per cent. of the fuel is obtained from the air itself, which we do not need to take with us. The explosion motor might certainly not necessarily be driven by gasolene, but might possibly be replaced by alcohol, as the gasolene in existence might some day be exhausted, while alcohol could be manufactured in so many ways as to be practically inexhaustible.

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ONCE more it's the automobile! This time the horseless one has ousted its oldest rival, the oatless one, off of Fifth avenue, and the last 'bus line of Manhattan is on its last wheels—though the vehicles themselves may migrate to some frontier town and yet be useful. Nobody will be sorry to miss them—they never for a day consoled the old-timers for the departure of the old-fashioned 'busses of Broadway, built on the lines of a coach though entered from the rear; for they, though as awkward and lumbering as these their latest survivors, were not only more commodious, but were decorated with the daintiest of landscapes and marine views painted in oils in the panels over the windows. It was not the day of advertising predigested foods or quack medicines, as in our present street cars. It was, perhaps, a little finer day, in some respects, when Washington Irving was the favorite author and there were even memories of the Spectator. The scenes depicted in these Broadway omnibus panels and in those of the stage coaches that jounced one down to the ferries and over the country roads

to far distant suburbs a dozen or a score of miles off, were of a very restful and pleasing sort.

It was a leisurely time, in comparison with the motorized, gasolened, steamed and electrified day of the present, and those who journeyed into the evening had time to get pleasantly acquainted with the spires and towers and trees and village greens depicted by the coach-makers' artists. Not a few of America's painters had such a page in their early history, and many have thought that William Hart never painted more attractively than when he did these bits of rustic scenery with a free brush in the Albany factory. James M. Hart also began painting that way, and we believe George H. Boughton did likewise. But this is far back in time. Since then Boughton and the Harts and others have grown famous and departed this life. The 'bus, where you pull the strap and demand change as you stand incerto pede with just room for your head, and hand up your bill or silver, afterward depositing your nickel in the box—where you yank the door strap by opening the door to get out—where you used to be given a bed of straw to keep your feet warm in winter days—the 'bus is going from its last antiquated refuge in the great city. There are to be electric motor cars in their stead, and the first lot of vehicles of that kind are now on trial. To ride in these will cost 10 cents anywhere between Washington Square and Eighty-eighth street, and it will be cheap at the price, too.

Each day now the automobile becomes more and more of a self-sustaining as well as self-propelling vehicle. The efforts of the improver have turned strongly in the direction of making the car carry everything needed for its protection from compulsory repair shop visitation. The latest thing in this line, as well as one of the most ingenious, is a vulcanizing plant intended for tire repairing which is carried on the car. At first thought this would seem to be going a trifle too far in the equipment line, but when it is known that the entire affair ready to vulcanize the tire weighs less than 20 pounds and packs away in case only 10x6x6 inches in size, one is inclined to believe that if the affair really does do the work it is intended to do, then the space it takes up in a car can profitably be allotted to it.

THERE was a time when the shrewdest, meanest, and generally most disreputable lot of crooks in the world were horse dealers. But not any more. To-day they have metamorphosed themselves into "second-hand automobile dealers," "garage owners," etc. Don't misunderstand me and think I am asserting that the second-hand dealers and garage owners are all crooks or even all ex-horse "gyps," for that is far from being true. What I mean to say is that the sudden popularity of the motor car has resulted in a decadence in equine interest on the part of the money spending public, with the very natural result that the crooks of the horse mart have quickly faced about and become the crooks of the motor mart. The amount of injury these very unwelcome recruits to the automobile trade have done and are doing the trade and the car is beyond compute. The barefacedness of the robbery these people constantly perpetrate in taking people's money in return for what they advertise as "bargains" in automobiles is absolutely as-

tounding. How they continue their freedom from arrest is beyond me.

To such an extent has this swindling and robbery now grown that it has reached a point where some concerted efforts on the part of the honest people in the trade should be made to at least check it, if not to stamp it out entirely. I believe the Manufacturers' Association could do nothing which would result so much to the benefit of the Association's own members and the public, too, as to relentlessly pursue these crooks until they were driven out of the automobile game. The most amateurish kind of detective work would invariably result in the speedy accumulation of sufficient evidence to send a dozen or so of the leaders of this gang of thieves to Sing Sing, while the moral effect of doing so would be far-reaching, even extending in some cases to quarters much higher up. I don't expect, however, that the Manufacturers' Association will do anything of the kind, so in the meantime my advice to bargain hunters is to hold on to their dollars when they go to buy "cheap" automobiles unless they know all about those who are anxious to sell the "bargains."

I am no cynic, but somehow
I cannot help but feel
The poor girl's choice is apt to be
The man with the automobile.

A long experience on the road and a close observance of the methods of handling and the driving of cars has forced on me the conviction that the vast majority of the troubles with cars and tires invariably result from the owner's or driver's own fault. The necessity cannot be too often, nor too strongly, impressed upon drivers of starting their cars from rest quietly and slowly, and gathering up speed gradually. The majority of cars are started and stopped with a jerk, causing obvious discomfort to the occupants, and throwing unnecessary strains on the tires, brakes and mechanism, which sooner or later bring about the troubles those who own the cars so much complain about.

THE inability of the physician to heal himself has always been accepted as one of the surest evidences of the inexactitude of the physician's profession. I saw an excellent example of this recently in connection with a corporation having a high-sounding name and which advertises to cure all the ills, from crooked chauffeurism clean down to police persecution, the automobilist is afflicted with, in consideration of a fat annual fee on the part of the automobilist. Despite the corporation's flamboyant advertisements of its power and ability to protect from annoyance all those who pay it the annual fee, the secretary was promptly arrested recently for exceeding the speed limit. Despite his official connection with the all-powerful organization, the secretary had to leave his watch for bail, and when arrested an hour later charged with again exceeding the legal speed limit, he was forced to leave his car in lieu of bail and proceed homeward on the plebian trolley car. From all this it would seem as though this trouble-saving corporation should at once proceed to add a bond-giving department to the many other departments it claims to place at the disposal of its subscribers in return for their annual subscriptions. Perhaps a course in speedometerics might also prove of much advantage to the corporation's secretary until the bond-supplying department is added and gets in good working order.

IN the good old town of New York the selling of fish is intimately connected with the blowing of a horn; just why, neither the fish seller nor anyone else is aware. Usually the fish seller, as gentle and kindly a soul as ever scuttled a ship or committed a murder, loads his fish in a wagon and proceeds to drive through the residential districts, making known his desire to dispose of his scaly stock in trade by ear-splitting blasts from the tin horn, supplemented by hoarse vocal lamentations which are in some way also deemed provocative of fish purchasing by all whose tympanums are thus assaulted. But the smell of gasolene has mingled its odor with that of the fish; the horn of commerce and the horn of sport vie one with the other. I was coming through a cross street heading for Broadway recently when the familiar "honk, honk, honk, honk!" of the motor car broke upon me, and I in turn broke for the safety of the sidewalk. From a safe coign of vantage there I looked around expecting to see a big touring car dashing up the thoroughfare. To my surprise there was not an automobile in sight. "That's funny," said I to myself. "I must be dreaming."

"Honk, honk, honk, honk!"

This time other passers halted. If there was an automobile in the vicinity it was invisible. "Maybe it is going so fast we can't see it," ventured one facetiously.

Then everybody stared in astonishment. The horn whose honk we had heard and feared was attached to a rickety fish cart.

"What in the world do you call that?" demanded a man who evidently wasn't any more pleased than I was at being made to jump around in the usual automobile dodging fashion.

"Why," replied the fishmonger, "that is me horn."

"An automobile horn?"

"Sure! We got tired tooting the old tin horn, so Bill and me told our customers along the line to watch out for four 'honks' and we bought this here horn. It saves our lungs and besides it saves time. When we get jammed up with other fish carts all we have to do is toot that horn and those in front clear out on the jump. They think one of them big Vanderbilt racing machines is about to hit them. Oh, there are tricks with the scales and fin men just like any other line."

If you would grow a business plant,
Your garden won't be neat;
You'll find you can't allow the grass
To grow beneath your feet.

WHAT I have said above about the ordinary form of auto horn reminds me that while it may be a very desirable adjunct to fish peddling, it never was and it never will be an advisable addition to an automobile. Did you ever meet one of those individuals the very sound of whose voice so acted upon your auditory and other nerves as to cause you to at once assume an antagonism without any knowledge or regard whatsoever as to the unfortunate person's claims upon your good opinion? Of course you have, and you know, too, how intense the feeeling of dislike is and how hard it is to overcome. That is exactly how I feel when I hear the usual rasping, rancorous squawk of the ordinary auto horn. It always seems as though some great bully was bellowing at me, "Get out of the way quick or I'll run you down,"

and at once the fighting Irish blood in me is aroused, but it being duly diluted with American sanguinary effusions, I control my fighting propensities and step quickly and wisely to a place of safety before even daring to look the anger I feel. Now, I'm only one of many who regard the squawker just as I do, and the car owner who employs this ungracious and unnecessary means of making us get out of his way simply makes enemies for himself and for automobiles without the slightest necessity for doing so.

Who has not heard that "a soft answer turneth away wrath," and who doubts either this or that the soft spoken request is quickest and most graciously granted? Therein lays all the argument I make against the blatant, blaring, brass bugle so favored by automobilists as a means of clearing the way for their cars. Why in the name of common sense the squawker is not cast aside for some more melodious method of asking for the right of way, like the Gabriel horn, for instance, I'll be blessed if I can see. With such a warning melodiously ringing in one's ears, the automobilist has half the battle for the right of way already won almost as soon as he has sounded the notes which warn others of his approach, and passing he leaves behind if not a friend at least not the enemy that formerly scowled at him when driven from the highway by the imperious bellow of that brazen bully, the auto horn.

I wish some one would transplant Judge McClure from the important city of Middleburg, Pa., where he now is, to the city of New York where he now isn't, but should be. Judge McClure, finding his judicial peace of mind disturbed by the coughs and barks of a carelessly attended to motor, issued an injunction against the owner of the motor preventing him from using the peace disturber until it had been properly throttled. A few more judges of the McClure stamp would very shortly make life considerable less of a burden for those who are forced to submit to the annoyance which results from someone else's employment of an unthrottled motor.

It's easy enough to be pleasant
When the car goes along like a song,
But the man worth while
Is the one who can smile
When everything about it goes wrong.

PROBABLY it is one of the results of the severe upper-cut experienced by the English language at the hands of the racing gentlemen and their new definition of the real meaning of the word "elimination," or it may be just the plain ordinary cussedness of the constable and the policeman, but for whatever the reason the fact is self-evident that most of the trouble resulting from the arrest and fining of automobilists for fast driving comes as a direct result of those arresting having an entirely different idea of the meaning of the word "speed" from that held by those they arrest.

Right here is where we really must get together. So long as we have begun changing the dictionary let us go right through the book and see that the remainder of the words there correspond with the new version of "elimination." Supposing we begin then with "speed." Now when the ordinary constable or policeman sees a great mass of machinery in the center of a cloud of dust and smoke coming down the road and only touching the high places in its coming, he becomes excited and at once proceeds by telephone and other means to do what he can to arrest the driver of the machine upon the charge of

speeding. How foolish! Nothing in it at all, simply an utter misunderstanding on the official's part of what the word "speed" means, according to the Long Island brand of racing lexicographers.

To get right down to it let the mistaken official at once understand that when an automobilist in a great big, gray painted car stripped of everything but the seats is proceeding along the road at a gait not greater than 50 miles per hour, that's "loafing"; over 50 and under 60 miles he is only "getting under way"; over 60 and not above 70 miles he is "under way"; between 70 and 80 he is just "letting her out," anywhere from 80 to 90 he's "going a bit," and then if he concludes to go faster than 90 miles an hour, that's "speed." Just a little heart to heart talk in matters of this kind is all that is needed to bring about a perfect understanding, and I hope that in the near future the publicity department of the Racing Board will see to it that a copy of the A. A. A. revised dictionary of the English language is placed in the possession of all those who have the power of arresting innocent people vested in them. The few examples I have noted above are proper meanings of words, and the improper meanings now attributed to them by others than A. A. A. racing officials have shown I am sure the urgent need of some such book distribution as I have outlined.

You may save a lot of money by not being able to buy the things you think you need on an automobile.

No wonder France feels kindly toward the automobile. The chairman of the committee which has just called upon the President of the Republic to secure his promise to open the forthcoming automobile show in Paris, pointed out that the export of French machines had this year already reached a value of $16,000,000, and that before the year closed it might be easily more than $20,000,000. Nice little bunch of money that! And you can just bet little old New York paid her share of it, all right, since the latest official returns compiled by George W. Whitehead, the Appraiser of the Port, shows that 119 motor cars were imported at New York in September, as against 72 in the same month a year ago. From January to September 772 cars, valued at $3,000,000, have been imported at this port, while in the same period of 1904 only 435 machines were brought in. Mr. Whitehead tells me that he estimates that fully 1,500 cars will have been entered this year at the New York Custom House, and for the majority of these it is the French maker who ultimately receives the good old American dollar.

FORMERLY it was the proud boast of the yachtsman that his was the only sport the expense of which kept it from becoming common through the butting in of the Me Too Brigade But that's not so to-day; a pair of duck "pants," a forty-cent yachting cap; a serge coat and the ownership of anything floatable from a canoe to a canal boat makes of their possessors "yachtsmen," according to the daily papers and the dictum of the gents themselves. Driven by all this to seek something, the price of which would at once place it way beyond even the wildest pipe dreams of the Me Toos, the millionaires have taken to and taken up automobile racing, and there they certainly have got their cheap imitators skinned to death. If you don't think so, just cast your eyes upon the bill those responsible for the running of the Vanderbilt race were called upon to pay, and see then if you don't believe that no one but a million-

aire has any chance at the game of automobile road racing. The statistics below are compiled by Col. Alfred Reeves, the gentleman whose careful and capable work has made the automobile department in the New York Globe the most entertaining and reliable one of its kind in metropolitan journalism. Mr. Reeves figures the cost of the little jamboree over on Long Island in this conservative fashion:

Value of cars	$200,000
Prizes from makers of cars and tires	25,000
Entry fees, $500 per car	14,000
Expense of 18 teams, board and salary of extra mechanics for one week	18,000
Training expenses of 18 drivers with chauffeurs and mechanics for two weeks	8,000
Traveling expenses of 10 foreign drivers and 40 mechanics, for machines and tires	15,000
Tires used—$1,000 for each car—tires being cut off with knives when punctured. Average cost of tires is $100 each	18,000
Expense of oiling course—70,000 gallons put on	5,000
Premium on $50,000 accident insurance in Lloyd's	1,500
400 deputies at $4	1,600
Expense of 30 emergency repair camps	6,000
Expense of 16 tire repair camps	2,000
Paid by spectators for boxes	10,000
Expense of telephones, linemen, officials, and help	1,000
Oil, gasolene and incidentals	2,000
Amount spent for 100,000 spectators	150,000
Total	$477,100

Talk about burning up money; well, if you can conflagrate it any quicker or in bigger wads than this, for heaven's sake trot out your system so us millionaires can be getting ready to play it before the Me Too Brigade catches up with us in automobile racing.

To the manufacturer who intends to turn out a better car some time, some time doesn't always come.

And what do the men who risked their lives and fortunes as above get if they are lucky enough to finish the event in the car they started in and not in an ambulance or a hearse? A little cheap notoriety, sometimes by the unthinking dubbed "glory"; a few paltry dollars and the possession temporarily of the most atrocious thing in the shape of a silver mug that was ever offered for competition by one of the best sportsmen in America. It is worth it? 'Twouldn't be for me, I can tell you. But what's the good of worrying about it anyway, the cup may go to France and from present indications it will be so blooming long before America brings it back that you and I, and all the rest of us will have forgotten about it.

No small amount of the trouble users have with securing satisfactory sparking, is the result of their through ignorance attempting to use coils which are in no way fitted for the particular motor on which they are employed. For each motor it is necessary to have a coil with definite characteristics, dependent on the construction of the cylinder, power of the motor, number of revolutions, sparking plug employed, and the type of commutator, and unless this identical kind of coil is provided nothing but trouble can result.

ONE does not waste as many years as I have spent in turning out alleged automobile copy without having seen history repeat itself a great many times. In the past seven years I think I must have seen the appearance and vanishing of no less than a dozen individuals who believed they had a special call to teach the people of this country just what was needed by them in the line of automobile publications. It is somewhat astonishing when I come to look over the headstones in that portion of the graveyard of blasted hopes set apart for automobile failures, to find that the majority of the occupants of the most expensive graves are foreigners, and most of the foreigners are English or Canadian. I do not know why this is so, nor do I attempt to explain it, I simply note the

fact and let you do your own deducing. To me the mystery is even greater than it will be to you, because I know what a British or a Canadian paper is, and anything more appalling in its utter lack of everything likely to interest an ordinary American than one of these affairs, I can not possibly imagine. How, therefore, graduates from these academies of mediocrity and antiquity ever thought they could come over to this the greatest reading and publishing country in the world, and teach us how to get out improved publications, beats me.

The latest of these would-be revolutionizers on the eve of his return "'ome to dear ol' Hengland," has seen fit to use up several columns in a contemporary to tell us how we are all wrong, don't cher know! and how most of us, according to British standards, are already "dead ones." The entire tirade, in view of its author's lamentable and colossal failure to do anything more successful than to blow in a few Steel Trust dollars for a confiding official thereof who really thought that the big Hollander could make good, is so thoroughly characteristic of the man and his type that it would be laughable were it not in a way pathetic. It may be that Americans do not know what Americans want to read, and that both the American readers and American writers are all wrong in their ideas that we are if anything oversupplied with the kind of reading that is wanted in this country, but even so, I can conceive of no place less likely to produce those capable of teaching us what is right and proper in this direction than the mother country. Of course, anything I or any one else might say will not deter new motor missionaries from emigrating to this country, nor from their ensnaring new angels to temporarily pay for their costly propaganda, but the result will be the same, and the headstones over their buried hopes will not differ materially from the many which now record how thankless and profitless a thing it is to attempt to transplant British journalistic ideas to American soil.

Although it is usually the custom to regard the running costs of a car as of comparatively small importance, it nevertheless constitutes one item of economy which will be taken seriously into account when motor vehicles come to be more generally used for commercial and business purposes. So far as the gasolene engine is concerned, we are not likely to see much reduction in these costs, unless some cheaper form of liquid fuel can be employed, but with the steam engine there are obviously opportunities of cutting down the fuel expense very considerably when the generator is finally perfected to be fired by heavy oils.

NO matter what your misfortunes may be, whether the pip or the plumber causes them, be sure that the real genesis of them is sure to be ultimately traced home to the automobile by the tribe of Wisenheimer, whose self-appointed talk it always is to promulgate the doctrine of I-told-you-so. Here in New York the gas has reached such an altitude in price and zero in illuminating power that even that long-suffering public for whom trusts have so little regard has at last made itself heard and compelled the gas company to answer. Now, what do you think the company says is responsible for the outrageous price of gas and the non-illuminating properties of what they give you for your money? Nothing but the automobile! Of course, any one might have known this would be the answer, but the way the company casts the burden upon the non-complaining already heavy

laden motor car is, to say the least, ingenious. Owing to the ever-increasing demand for gasolene, begotten of the automobile, the gas company declares it can no longer afford to use gasolene in the enriching of its product. The gas company maintains that its product is as good as it ever was, even if it is obliged to accept substitutes for the gasolene which only a few years ago it could have had for little more than the asking, when the refiners either threw away the fluid or used it to burn under the stills. When a quotation of nine and a half cents a gallon was given in 1900 it was thought the maximum price had been reached.

Of course, there is an atom of truth in all this, because gasolene really has the highest illuminating qualities of products of its class. The gas company declares the cheaper hydrocarbons which are now used are so manipulated that the candle power of the gas is not lessened. The gas which is now served to consumers in New York is composed of vapor obtained from the combustion of coal mixed with superheated steam, and then enriched at present with naphtha of various grades and a distillate from cheap Texas petroleum known as "gas oil," which are not the subject of any published quotations, being disposed of by contract, at a price not far from eight cents a gallon. In the making of ten thousand cubic feet of carbureted water gas four and a quarter gallons of gasolene would be required, so when you come right down to it you can see just how much the automobile is really to blame for the robbery the gas company perpetrates upon the public.

In the first days of automatic locomotion, the electric carriage failed to score the success it should have had, because it was expected to do things which at that early stage of mechanical traction were impossible. In the case of the electric cab, for example, the fares asked were entirely too cheap and out of all proportion for the class of service the cab was called upon to render. This mistake has never been made with the gasolene car, and $4.00 or $5.00 an hour is a standard price for car and chauffeur, while electric cabs are glad to get less than half of that.

WHILE not vouching for the truth of the story in any way, I have it from what I consider pretty good authority that the steady advance in the price of gasolene grows out of a ride a big man in the Standard Oil Company, much against his will, was induced to take in a friend's car just about the beginning of the motor car craze. In the course of this ride the enthusiastic motorcarist was so loud and so long in his praise of the cheapness of the gasolene motor as compared to any other that the less talkative but deeper thinking Standard Oil man made up his mind to see that the automobilist's enjoyment was made duly profitable to the great S. O. C. What was the result? To-day Standard gasolene, of 86 per cent., is quoted at seventeen cents a gallon wholesale, nineteen cents being asked for the 88 per cent. variety, and twenty-two cents a gallon for the 90 per cent. grade. Of course the advance in price is a purely arbitrary one on the part of the S. O. philanthropists, since the cost of manufacture is no more than it was. The product for which the garage keeper pays seventeen cents or less for grades below standard is sold by him at twenty-five cents a gallon to the car owner. In some places the man with the motor car is made to pay from thirty to forty cents a gallon. The Standard Oil Company, knowing this condition, keeps the price soaring, and the auto-

mobilist, true to his reputation of being the juiciest good thing that ever let his money go with both hands, pays the bill.

WHAT I, and a whole lot of other people who are neither millionaires nor mutton heads, should like to see would be the development of a thoroughly sound single cylinder two speeded car, shod with solid tires and offering comfortable accommodation for four people. This is a type that many of you I know would sneer at, but it is one which, nevertheless, is very much wanted. There are plenty of people who can afford to buy an automobile, but they will not undertake the trouble of looking after a complicated vehicle, still less do they relish the idea of roadside tire repairing, or the more expensive even if more satisfactory repair shop doing of the same thing. Solid tires eventually wear out, but they give ample warning of the approaching end of their active life, and on a moderately speeded car this warning is a very long one. It is true that many of the roadside delays due to air tires are simply and solely from the fact that tires too small for the work are used, or insufficient rubber is employed in the tread, or the fabric is too thin. A great deal too much emphasis is placed upon resiliency. It is desirable to have this in a tire, but it is far better, I believe, to have reliability, it apparently seeming almost impossible to get both in the same tire. A thin lively tire will not stand the same amount of work that a thicker, stronger and, consequently, less resilient one, but as the engine will not complain of a little extra load, it appears to me that cars not intended for speed, and speed alone, should be fitted with the strongest possible tires. If this were the case, the prejudice against pneumatic tires would be to a large extent overcome, for the simple reason that they would give practically no trouble. It is not possible to make a super-reliable tire of quite the same efficiency in the matter of the absorption of engine power, but this is a matter of small moment. With regard to comfort, what is lost by having the thicker and less responsive tire could be made up by equipping the car with very easy springs, not only to the road axles, but in the cushions, particularly if backs as well as seats were properly sprung. These spring seats alone make a great difference, while the comforts of spring hassocks and foot bounds have only been exploited in a very few cases. To return to the simple car I favor, it should be clearly understood I do not mean that it should be a "cheap" vehicle. To the contrary.

The car I and my supporters want should be as good as it can possibly be made, and a handsome looking one, too. Its cheapness should be looked for not in its selling price, which, although reasonable, would not, and could not, be low in the ordinary acceptance of the term, but in the small expense necessary to keep the car in thorough repair and perfect running order. In fact, at first glance, considering its simplicity, the car I have in mind would appear dear. There are already cars to be had which very nearly approximate to my ideas, but it must be confessed that they have not met with so much encouragement as their makers might have expected, though this as a rule has been because, like the proverbial good woman, they were so blamed homely that they attract no one. Whatever may be the case with a woman it is not true with an automobile, that it is not easy for it to be at one and the same time pretty and good. Automobiles can be built and eventually will be built to meet the conditions I have roughly outlined above, and they will be sightly cars, too, not the

motorific nightmares we have had in the past, where designers have set out to produce a vehicle which was useful and not altogether ornamental.

Verily, it takes no great amount of imagination for one to think of a modern Polonius thus advising a son anxious to break in to the gilded circle of high sassiety:

"Costly thy car as thy purse can buy,
But not express'd in fancy; rich, not gaudy;
For the automobile oft proclaims the man."

After the boy takes the old man's advice all that the giver of the advice has to do is to draw a check of not less than five figures to pay for the car and fixin's, and there you are. Easy enough when you understand how to do it, isn't it?

LET me tell you the merry millenium of automobile manufacture is approaching over a smooth road driven by a 200 H. P. motor, at top speed when you see a reputable concern offering to sell you an up-to-date car "guaranteed free of repairs for one year." While I can not make out from this peculiar wording whether the company guarantees the car will remain free from the need of any repairing for one year, or whether it is intended to mean that the company will make all repairs at no expense to the purchaser during the first twelve months of his ownership, it does not really matter, since in either event it does mean that the man who buys one of these cars will have at least a year's enjoyment out of it, after which time he can sell it and buy a new car with another guarantee, repeating the operation at regular periods so as to make his automobiling a thing entirely free from any of the expense attending the payment of the chauffeur's commissions as they are usually added to the repairer's bills.

WERE it left to the disciples of Ade to describe him, I fear that the best Mahomet could expect at the hands of the modern would be the verdict that Mahomet was a wise old guy when he concluded to go to the mountain upon ascertaining beyond question that it was useless to expect the mountain to come to him. To-day men waste no time beckoning mountains and such like to come their way, for when they really want the mountain they hie themselves to a railway and rush mountainward speedily and comfortably. The great big buying public is a mountain, and if you want any part of it you've got to get out and go after it in mighty short order, I can tell you, because if you wait for it to come to you, you are liable to wake up from your Rip Van Winkling some morning broke. The automobile trade, it must be admitted, has not lost any of its time waving the handkerchief of flirtatious invitation at the mountain of possible purchasers, but has gone boldly at the elevation and annexed it whether or no, but in all the trade's progressiveness it never played the game as comprehensively as the Winton people have done with their special car.

There's something mighty close to business genius, let me tell you! See where the Winton people will be by the time their competitors are ready to show their new models to the public! The cream of the 1906 milking will have been well skimmed off by the astute Clevelanders, who, like modern Caesars, will have gone, seen and captured the buyer by means of their special car and its artistically staged and competently demonstrated 1906 Winton. Time is always money, but in this automobile trade of ours just about show time it is a whole lot of money more than usual, and the clever Clevelanders have recognized this and gone to the mountain after it in a way that can't fail to win.

Our racing men leave behind them,
As they zipp past those who drive,
Dust and odors to remind them
That it's lucky they're alive.

I'M taking off my hat to Mr. E. R. Thomas, of Buffalo, in recognition of his generous offer for a prize to be known as the Home Industry Cup. If we have not now progressed far enough to beat the foreigners at this racing game, for goodness sake let us open up an American racing kindergarten and practice among and on ourselves until we have learned enough of the game to go up against the foreigners with some chance of defeating them. If Mr. Thomas would still further increase this country's debt to him he might offer some sort of a prize which would result in producing competent racing authorities and above all things limiting that competition to Americans only, too. As it is now, racing in this country is mismanaged by a highly respectable body of well meaning, but absolutely incompetent, gentlemen, whose whole idea of what to do is based upon the way racing is managed abroad, and not upon any thought of how it should be conducted in this country, a condition of affairs not altogether disconnected with these gentlemen's inordinate love for foreign built cars and their rather poor estimate of the American made car and everything connected with it.

"LIKE master, like man," is an old saying which goes far toward explaining why so many utterly incompetent pretenders draw the out-of-all-proportion-to-their-worth remuneration of chauffeurs. The car owner who pays them knows nothing about what the automobile hired man should do, the hired man discovers this at once and proceeds to do as he pleases and when he pleases. The result is far from satisfactory to any one outside of the alleged chauffeur and his active side partner, the repair man. As affording a basis upon which to construct a workable schedule for a chauffeur's day, the following prepared by one of the foremost authorities in Great Britain for one of his titled patrons is well worth studying and imitating:

1. The chauffeur to commence his duties at 7 A. M., and the time from this hour until 8.30 A. M. to be reserved solely for the cleaning and general overhauling of the car.

2. At 8.30 A. M. the chauffeur must call for his orders for the morning.

3. The car and mechanism to be kept scrupulously clean.

4. Any negligence in the upkeep of the car which may tend to jeopardize the safety of the occupants when driving will be looked upon as an unpardonable offense, and will render the driver liable to instant dismissal.

5. It is to be clearly understood that when driving Lady —— the car is not to exceed 15 miles an hour under any circumstances whatever, and in the streets of a town or other places where there is traffic, the speed should not exceed at most 7 or 8 miles an hour, and less, according to circumstancees.

6. Smoking is prohibited while cleaning or working on the car.

7. No so-called improvements or alterations are to be made to the working parts of the car without express authority.

8. Any complaint regarding the unsatisfactory working of the car through suspected structural defects is to be reported in writing. Arrangements will be made to have the car inspected at regular intervals.

9. The chauffeur is expected to be within call throughout the day, when the car is not being used by the family.

10. The car must never be put away at night without being cleaned.

11. Tools, spare parts, tires and other accessories, when not in use, to be placed in the cupboards and shelves provided for the purpose.

12. When driving the car, every action should be gentle and not sudden, and corners should be taken slowly. Use the brakes as little as possible. Clutch to be kept well lubricated.

13. If the chauffeur considers that he has not time to look after the car conscientiously, he is to inform the owner in writing, when an inquiry will be made, and, if found necessary, the car will be left unused, at a time convenient, for a sufficient period for the chauffeur to complete his work.

14. A thorough examination should be made weekly by the chauffeur to see that the nuts and bolts are tight and securely fastened.

15. Care should be taken that every moving joint is lubricated directly before taking the car for a run. Such joints as radius-rod ends, spring clips, clutch actuating gear, etc., etc., also all grease cups, should be attended to.

16. All accumulators must be kept fully charged with acid solution and current, and all electrical terminals kept clean and tight.

17. Gasolene should only be poured into tanks when car is outside coach-house, as the close proximity of the gas-jet to car with full tanks would be a danger should this regulation be overlooked.

I TOOK occasion in these pages last month to comment upon the peculiar craniological twist which made Justice Fort, when charging a New Jersey grand jury in an automobile accident case, declare that he could find no law upon the statute books which would permit automobiles to use the highway under any circumstances. While Judge Fort is a fellow Jerseyman, yet even so, that prince of good fellows and that exceedingly good friend of all reputable automobilists, W. E. Scarritt, does not defend him in this kind of Jersey justice. To the contrary, Mr. Scarritt has taken prompt steps to show that even Justice Fort should know something of law, even where so unworthy a thing as the automobile is concerned, and has therefore called attention to the entirely different and consequently more logical view of the situation which has just been taken under the Pennsylvania law by Judge H. K. Weand, in the Montgomery County (Pa.) circuit. In Silberman vs. Huyette, one of the first cases tried in Pennsylvania where the question of the responsibility for an accident from an automobile was involved, Judge Weand laid down the law in what seems to me a perfectly fair manner as follows:

"A man has as much right to run an automobile on the public road as he has to run any other vehicle, and if making no more noise than required to operate it, even though a horse shied and an accident happened to the driver, the automobilist, if running at reasonable speed, cannot be held liable.

"It is only when an automobile is operated carelessly that the owner may be held liable. It is common experience that horses will take fright at street cars or even wheelbarrows. If a horse shies at a wheelbarrow the man who pushes it is not liable for the consequences. So with automobiles."

The expression "Long and short of it," is readily understood when the price of an automobile makes you long for money and you are short of it.

THE OUTSIDER.